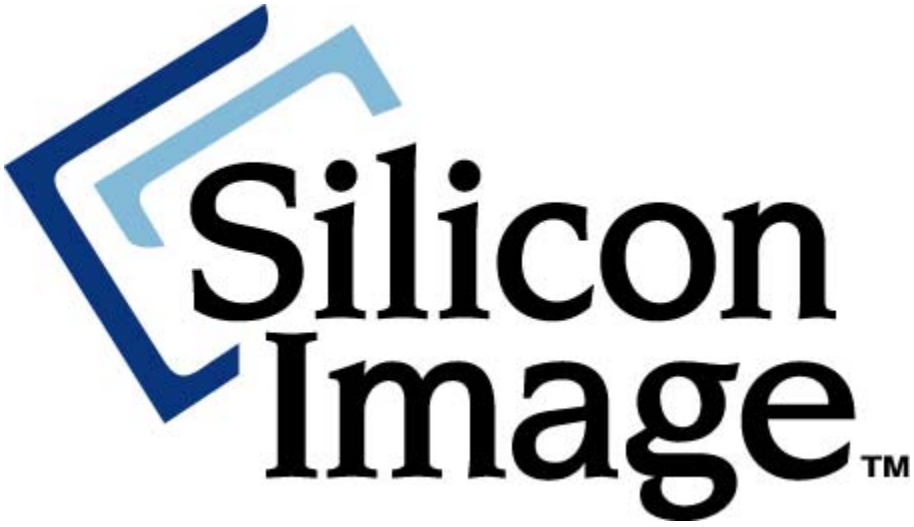

Sil57XX-Series
SteelVine Manager
User's Guide

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About This Guide

This guide explains how to use the SteelVine Manager software to configure and monitor SteelVine Storage Reference Design hardware platforms. The SteelVine Manager provides utilities to create and customize basic configurations; these can also be created by manipulating the rotary switch and push-button on the back of the appliance. The SteelVine Manager also provides monitoring utilities to supplement information gathered by observing the light-emitting diodes (LEDs) on the front of the SteelVine Storage Reference Design.

***Note**: The SteelVine Manager User's Guide presents screens that were captured using Microsoft Windows XP. If a dialog appears differently on the Macintosh and Windows operating systems, Mac OS X images are presented in addition to the MS Windows images. Linux images are not presented.*

Audience

The primary audience for this guide consists of system integrators (SIs) and value added resellers (VARs) who offer products that are based on SteelVine Storage Processor and sell them to end users as ready-to-use storage devices.

A secondary audience consists of OEMs that purchase SteelVine Storage Processors and use the SteelVine Manager to configure their appliances. This manual provides an initial starting point for OEMs to prepare their own end-user documentation.

***Note:** The information is this manual pertains to the initial release of the 57XX-Series SteelVine Manager software. Some product features may not be available or fully implemented at this time, even though they are described here. Those items are identified as "**Not Implemented Yet**". Those items will be included in future release of the product.*

1 Introducing the SteelVine Storage Reference Design

This chapter introduces the family of 57XX-Series SteelVine Storage Reference Designs through a product overview and definitions of SteelVine Storage Reference Design storage policies.

Product Overview

The SteelVine Storage Reference Designs are available from leading storage partners in pre-configured set-ups with eSATA host connections, some also include USB host connections. Simply open the box and connect the appliance with an appropriate host cable; it's that simple.

The SteelVine Storage Processors are available in four different configurations, each offering a different subset of features and capabilities, as shown in the following table:

Table 1 - Available Product Features by Chip Type

Feature	Sil5744	Sil5734	Sil5733	Sil5723
Host Connections				
SATA	Yes	Yes	Yes	Yes
USB	Yes	Yes	--	--
Storage Policies				
JBOD	Yes	Yes	Yes	Yes
BIG	Yes	Yes	Yes	Yes
FAST	Yes	--	Yes	Yes
SAFE	Yes	--	Yes	Yes
SAFE33	Yes	--	Yes	Yes
SAFE50	Yes	--	Yes	Yes
Other Features				
Drive Locking	Manual	Manual	Automatic	Manual
All Others Features	Yes	Yes	Yes	Yes

Throughout the remainder of this manual, all descriptions and screen images reflect the SiI5744, which supports all product features. All references to "rotary switch" refer to the settings of the CONFIG[2:0] pins, which can be hard-strapped to a specific configuration, or dynamically selected using a rotary switch selection.

SteelVine Storage Processors are powered by Silicon Image's industry-leading SteelVine™ architecture (see Figure 1) which provides:

- SATA or USB host connectivity
- eSATA capable on all SATA ports
- Enhanced data protection
- High-performance storage
- Plug-and-play functionality
- Virtualization capabilities (to map the physical hard drives to virtual volumes)
- Cascading
- Automatic disk rebuild (when one or more **SAFE** volumes are configured)
- Drive Locking (Data Security)
- Backup Button

The SteelVine Manager software includes a graphical user interface (GUI) for Windows, Macintosh and Linux (not implemented yet) operating systems that allows you to configure, manage, and monitor the SteelVine Storage Reference Design, hard disk drives, and virtual volumes. The SteelVine Storage Reference Designs can also be configured, managed and monitored without using the SteelVine Manager software.

Note: *For the first release of this product, the SteelVine Manager GUI can only be used to configure and manage the top-level node of a cascaded configuration. In addition, support for Macintosh and Linux host platforms will be available in a future release.*

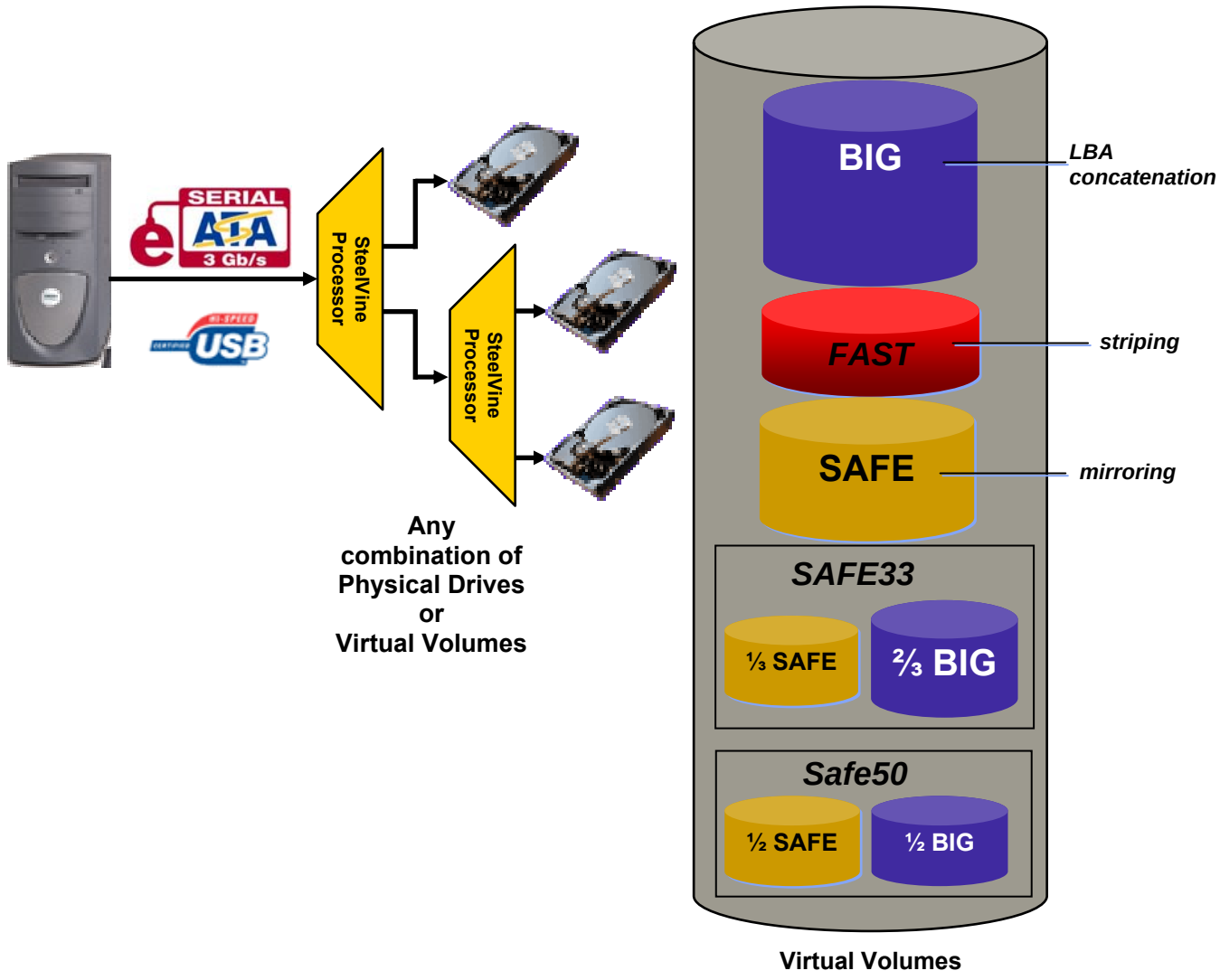


Figure 1 - SteelVine Architecture

Populated with two external Serial ATA (eSATA) hard disk drives (HDDs), each SteelVine Storage Reference Design Storage Appliance can manage as much as 2,000 gigabytes (i.e., 2 terabytes) of data, depending on the capacity of the hard disk drives that are installed. By combining multiple SteelVine Storage Reference Designs in a daisy-chained hierarchy structure, you can increase the total storage capacity of your system. For more information refer to SteelVine Storage Policies on page 6 and Cascading on page 12.

SATA Features

The SteelVine Storage Reference Design provides the following Serial Advanced Technology Attachment (SATA) features:

- Automatic negotiation between SATA I (1.5Gbps) and SATA II (3.0 Gbps)
- Serial ATA 2.5 specification compliance (Gen2m)
- Serial ATA Port Multiplier 1.1 specification compliance

For detailed information about SATA technology, refer to the following specifications online:

- Serial ATA: High Speed Serialized AT Attachment, Revision 1.0a
- Serial ATA II: Extensions to Serial ATA 1.0a, Revision 1.1
- Serial ATA II: Port Multiplier, Revision 1.1

The Serial ATA web site is http://www.serialata.org/.

USB Features

The SteelVine Storage Reference Design provides the following Universal Serial Bus (USB) features:

- USB 1.0 and USB 2.0 specification compliance

For detailed information about USB technology, refer to the following specifications online:

- Universal Serial Bus Specification, Revision 1.1
- Universal Serial Bus Specification, Revision 2.0
- The USB Organization web site is http://www.usb.org/.

Using the SteelVine Storage Reference Design

You can use the SteelVine Storage Reference Design in any of the followings ways:

Appliance-Only Mode

This mode allows you to use the SteelVine Storage Reference Design with the device's LEDs to indicate status, without using the SteelVine Manager GUI software. To select a storage policy in this mode the first time that a new factory-shipped product is used, ensure that the hard disk drives are installed, set the rotary switch on the back of the SteelVine Storage Reference Design to the desired Storage Policy (not the GUI selection) and turn on the power. To change the storage policy thereafter, set the rotary switch to the desired position and press the recessed **Mode Change** push-button to create the new virtual volume(s). Creating new virtual volumes will destroy any existing data that existed on the previous volume, but expanding an existing BIG volume will not destroy any existing data.

Status-Only Mode

This mode allows you to use the SteelVine Storage Reference Design with the SteelVine Manager GUI to monitor the status of the appliance (i.e., temperature, fan speeds, storage capacity, and RAID mode of the desired hard drive), but not make Storage Policy configuration changes through the GUI. To select a storage policy in this mode the first time that the product is used, ensure that the hard disk drives are installed, set the rotary switch on the back of the SteelVine Storage Reference Design to the desired Storage Policy (not the GUI selection) and turn on the power. To change the storage policy thereafter, set the rotary switch to the desired position and press the recessed **Mode Change** push-button to create the new virtual volume(s). Note that creating new virtual volumes will destroy any existing data that existed on the previous volume.

GUI Mode

This mode allows you to use the SteelVine Manager GUI to configure the Storage Policy and other settings as well as monitor the status of the appliance (i.e., temperature, fan speeds, storage capacity, and RAID mode of the desired hard drive). To select this mode the first time that the product is used, ensure that the hard disk drives are installed, set the rotary switch on the back of the SteelVine Storage Reference Design to the GUI position and turn on the power. In this mode, no virtual volume(s) will be created until the storage policy and volume selections are made through the GUI. To change from GUI mode to some other fixed storage policy thereafter, set the rotary switch to the desired position and press the push-button to create the new virtual volume(s).

SteelVine Storage Policies

You can configure the SteelVine Storage Reference Design to use any of the following Storage Policies to map the appliance's physical hard drives to virtual drives that are visible to the host computer. The virtual drives are called *volumes* in the GUI. The host operating system treats each volume as if it were a single physical drive. This virtualization allows you to overcome restrictions that are imposed by physical hard drives, such as speed, storage capacity or data storage reliability.

BIG

The BIG storage policy concatenates a series of physical hard drives as a single large volume; resulting in a seamless expansion of virtual *volumes* beyond the physical limitations of singularly connected hard drives. SteelVine BIG storage policy delivers maximum storage space without a single large capacity and costly hard drive.

Any node within a cascaded configuration can be set to BIG. For more information about Cascading refer to Page 12.

Hard drive A and B are concatenated into a single virtual *volume* in the Figure below with a storage capacity that is equal to the sum of each of the physical hard drives A and B.

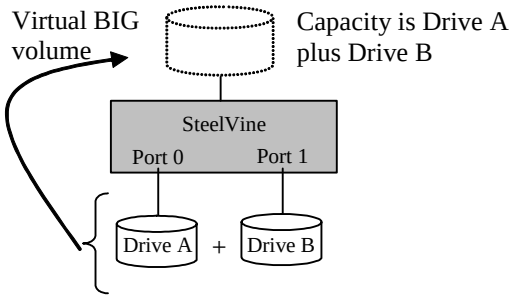


Figure 2 - BIG storage policy sample configuration

It is also possible to create a BIG volume using only a single hard disk drive connected to Port 0, and then increase the storage capacity of the volume later by adding another hard disk drive (or another SteelVine Storage Processor with at least one hard disk drive) to Port 1 and pressing the Mode Change push-button. The new disk blocks of Port 1 will be concatenated to the end of the disk blocks of Port 0, and any data that is stored on the existing BIG volume will be preserved. However, it is not possible to expand an existing BIG volume by adding another hard disk drive to Port 0 and still preserve any existing data on that volume.

JBOD

The JBOD (Just a Bunch of Disks) storage policy enables each hard drive to be seen separately as one drive. When using a SATA host controller, JBOD should only be used if the SATA host controller provides Port Multiplier (PM) support. If a host is not PM-aware, only a single drive is presented (drive 0). No such limitation if using a USB host connection.

JBOD storage policy is available in the SteelVine Manager for a standalone (non-cascaded) Storage Processor or the top-level node of a cascaded configuration, but not for subordinate nodes. Even though you **can** use the rotary switch to select JBOD mode for **any** node in a cascaded configuration, only the **first** JBOD volume of any subordinate node is detected by your host. Therefore, selecting JBOD mode for any subordinate node is **not** recommended.

In a **JBOD** configuration, the SteelVine Storage Reference Design directly exposes each physical drive.

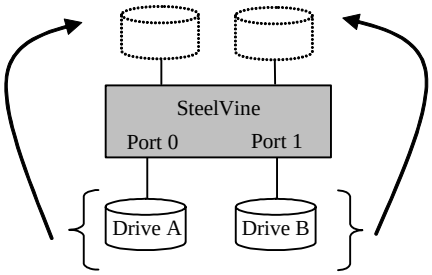


Figure 3 - JBOD storage policy sample configuration

FAST

The FAST storage policy distributes access across all hard disks, also called *striping* (equivalent to RAID 0). FAST presents the best data speed but no data redundancy. FAST storage policy accelerates hard disk operating speed by using many disks in parallel. Hard drive data segments are written to different disks simultaneously which increases performance while sacrificing data redundancy.

To implement the **FAST** storage policy, the SteelVine Storage Processor creates a single virtual volume that is *striped* across both hard drives, with a storage capacity that is equal to the sum of both hard disk drives.

It is possible to set any node within a cascaded configuration to FAST, although there is no performance benefit when using multiple layers of striping.

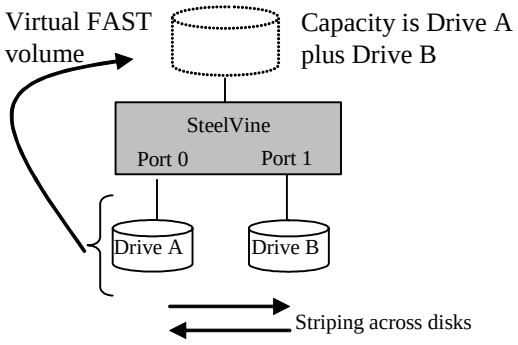


Figure 4 - FAST storage policy sample configuration

SAFE

The SAFE storage policy stores all data in duplicate on separate drives to protect against data loss due to drive failure. One drive *mirrors* the other at all times, equivalent to RAID 1. Every write operation goes to both drives. SAFE provides the highest level of data protection for critical data that you cannot afford to lose if a hard drive fails, but halves the amount of storage capacity because all data must be stored twice. The resulting storage capacity of the virtual SAFE volume will be equivalent to the size of one hard drive (if both drives are the same) or the smaller of the two drives (if they are different).

If one drive fails, the SAFE volume is still usable, but it is in a vulnerable state because its mirrored hard drive is inaccessible. When the offline drive comes back online, the appliance begins a rebuild process immediately to restore data redundancy. A message box appears in the GUI to notify you that a rebuild is in progress.

Although the volume remains available during the rebuild process, the volume is susceptible to data loss through damage to the remaining drive until redundancy is restored at the end of the rebuild and verification process. Host access takes precedence over the rebuild process. If you continue to use the SAFE volume during the rebuild, the rebuild process will take a longer time to complete, and the host data transfer performance will also be affected.

Any node within a cascaded configuration can be set to SAFE, but it is more efficient to use the SAFE policy at the lowest possible level within the hierarchy.

It is also possible to create a SAFE volume using one hard disk drive connected to Port 0 of the SteelVine Storage Reference Design, although no mirroring will occur until a second hard disk drive is connected to Port 1. With only one hard disk drive connected, the SAFE volume will be available, although no data protection will be provided until a second hard disk drive is connected.

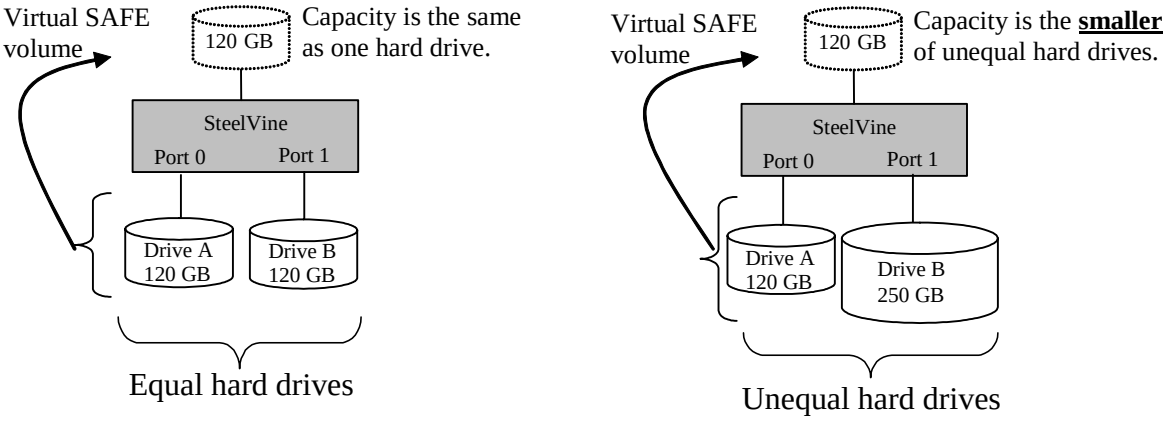


Figure 5 - SAFE storage policy sample configuration

SAFE33

The SAFE33 storage policy creates two virtual volumes; one SAFE volume and one BIG volume, and should be used when you need the high reliability for some of your data (with the added overhead of mirroring) but you don't need high reliability for the remainder of your data. SAFE33 reduces the cost of additional hard drives in operations where non-critical data could be lost without severe consequences.

SAFE33 uses a SAFE volume that is mirrored across two hard drives to protect your critical data in the event a hard drive failure. If one drive fails the SAFE volume is retrievable although the BIG volume is not. When you replace the failed drive, the SAFE volume is automatically rebuilt on to the replacement drive.

For example, if you are using a video editing application that stores the primary source data and also uses some temporary storage for editing, you need protected storage that is offered by SAFE for the primary source data, but you do not need protected storage for the temporary data. Therefore, the combination of SAFE and BIG would be the most efficient utilization of your available storage capacity. If either hard drive fails the primary data stored on the SAFE volume would still be available whereas the temporary data stored on the BIG volume would be lost.

The size of the SAFE volume of a SAFE33 policy will be one-third of the size of one hard drive (if they are equal) or one-third of the size of the **smaller (if they are not equal.**) The size of the BIG volume will be the combination of all remaining capacities.

Example: *In Figure 6 below, assume that Drives A and B are 300 GB each. When the* ***SAFE33*** *Storage Policy is selected, the resulting virtual volumes will include* ***SAFE*** *volume of 100 GB (1/3 of 300 GB) and a* ***BIG*** *volume of 400 GB (the remaining capacity after allocating 100 GB from each of the hard drives).*

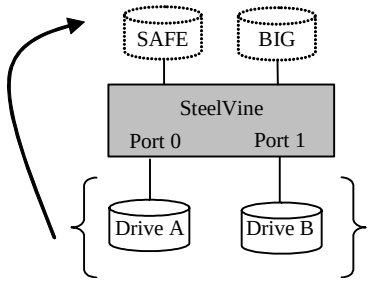


Figure 6 - SAFE33 storage policy sample configuration

When using a SATA host connection, you must have a PM (Port Multiplier) aware host adapter when using SAFE33 on the top level node of a cascaded configuration so that ALL volumes can be detected by the host. If your SATA host adaptor is not PM aware, then ONLY the SAFE volume will be detected and the BIG volume will not be accessible. No such limitation exists when using a USB host connection.

For subordinate nodes in a cascaded configuration, it is possible to configure a SAFE33 storage policy, although you will only see the SAFE volume from that node. Therefore, the SAFE33 storage policy should only be used at the top-level node of a cascaded configuration.

In this mode, the Schedule/Verify option is enabled.

Refer to the Capacity Expansion for SAFE33 & SAFE50 section below for additional information about expanding the storage capacity for the SAFE33 Storage Policy.

SAFE50

The SAFE50 storage policy creates two virtual volumes; one SAFE volume and one BIG volume, and should be used when you need the high reliability for some of your data (with the added overhead of mirroring) but you don't need high reliability for the remainder of your data. SAFE50 reduces the cost of additional hard drives in operations where non-critical data could be lost without severe consequences.

SAFE50 uses a SAFE volume that is mirrored across two hard drives to protect your critical data in the event a hard drive failure. If one drive fails the SAFE volume is retrievable although the BIG volume is not. When you replace the failed drive, the SAFE volume is automatically rebuilt on to the replacement drive.

For example, if you are using a video editing application that stores the primary source data and also uses some temporary storage for editing, you need protected storage that is offered by SAFE for the primary source data, but you do not need protected storage for the temporary data. Therefore, the combination of SAFE and BIG would be the most efficient utilization of your

available storage capacity. If either hard drive fails the primary data stored on the SAFE volume would still be available whereas the temporary data stored on the BIG volume would be lost.

The size of the SAFE volume of a SAFE50 policy will be one-half of the size of one hard drive (if they are equal) or one-half of the size of the **smaller (if they are not equal)**. The size of the BIG volume will be the combination of all remaining capacities.

Example: *In Figure 7 below, assume that Drives A and B are 300 GB each. When the* ***SAFE50*** *Storage Policy is selected, the resulting virtual volumes will include* ***SAFE*** *volume of 150 GB (1/2 of 300 GB) and a* ***BIG*** *volume of 300 GB (the remaining capacity after allocating 150 GB from each of the hard drives).*

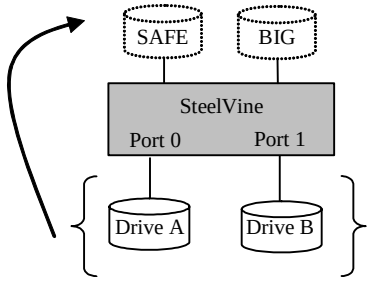


Figure 7 - SAFE50 storage policy sample configuration

When using a SATA host connection, you must have a PM (Port Multiplier) aware host adapter when using SAFE50 on the top level node of a cascaded configuration so that ALL volumes can be detected by the host. If your SATA host adaptor is not PM aware, then ONLY the SAFE volume will be detected and the BIG volume will not be accessible. No such limitation exists when using a USB host connection.

For subordinate nodes in a cascaded configuration, it is possible to configure the SAFE50 storage policy, although you will only see the SAFE volume from that node. Therefore, the SAFE50 storage policy should only be used at the top-level node of a cascaded configuration.

In this mode, the Schedule/Verify option is enabled.

Refer to the Capacity Expansion for SAFE33 & SAFE50 section below for additional information about expanding the storage capacity for the SAFE50 Storage Policy.

Capacity Expansion for SAFE33 & SAFE50

When using the **SAFE33** and **SAFE50** storage policies, it is possible to begin with a single hard disk drive, and then add a second hard disk drive to increase the size of the BIG virtual volume (and to provide the data protection of the SAFE volume using mirroring) when additional hard disk storage capacity is added.

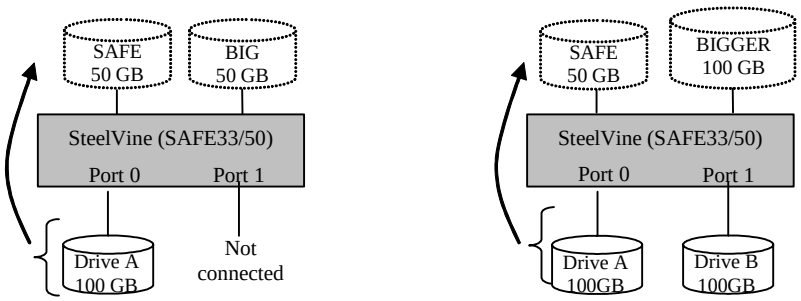


Figure 8 - SAFE33 or SAFE50 Capacity Expansion

Figure 8 shows an example of a single-drive **SAFE33** or **SAFE50** Storage Policy configuration consisting of a 100GB hard drive (Drive A) connected to Port 0. Assuming that a SAFE50 Storage Policy is used, a 50GB SAFE volume and a 50GB BIG volume will be created, although the SAFE volume will be in a degraded (non-mirrored) state. When Drive B is connected to Port 1 to increase the storage capacity, the SAFE volume will be able to complete the mirror by using 50GB from the Drive B, and the remaining capacity will be added to the existing BIG volume, increasing it from 50GB to 100GB.

***Important**: Some additional steps **will be** needed on your host computer system to allow it to recognize a volume that has been dynamically expanded – refer to Appendix A through C for more information.*

Cascading

The cascading feature allows you to configure as much storage capacity as you need; as few as two drives or as many as eight. Refer to Figure 9 for some examples of cascaded configurations.

Cascading allows you to customize the amount of storage capacity without the financial, technical and logistical downsides of traditional backup and restore methods. Multiple SteelVine Storage Reference Designs can be daisy-chained together in a hierarchical structure that combines the storage capacities from all units. By combining multiple SteelVine Storage Reference Design platforms in a cascaded configuration, multiple device/drive configurations can be presented as virtual volumes, which results in a larger storage capacity than upgrading to larger physical hard disk drives.

You can cascade SteelVine Storage Reference Design platforms up to 3 levels deep, with one top-level node, up to two second-level nodes and up to four third-level nodes. Any combination of hard drives and/or SteelVine Storage Reference Designs can be connected in a cascaded configuration. You can connect any of the following combinations of devices to a SteelVine processor: two hard drives, one hard drive and one SteelVine Storage Reference Design platform, or two SteelVine Storage Reference Design platforms.

Figure 9 shows various SteelVine device configurations that can be assembled using multiple SteelVine Storage Reference Design platforms and multiple hard disk drives.

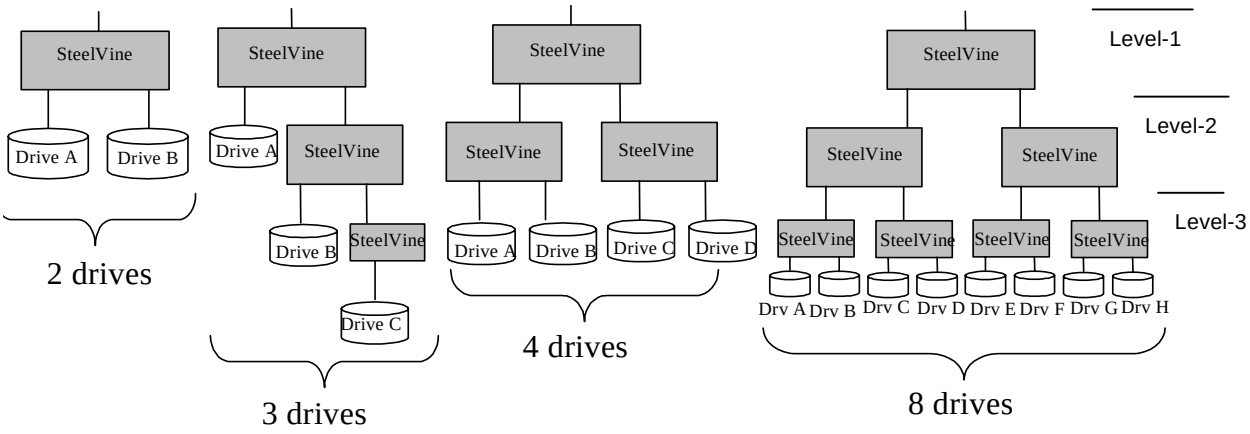


Figure 9 - Cascading drive configuration options

Note: *The SATA link between cascaded nodes in a cascaded configuration is not Port Multiplier aware. Therefore, although it is possible to configure lower-level nodes (subordinate to the top-level mode) to use JBOD, SAFE33 or SAFE50 Storage Policies, only the first volume for that node will be visible to any upper-level node.*

When creating virtual volumes with a cascaded configuration, ensure that all hard disk drives are properly installed and that all SATA connections between the cascaded nodes are secure. You must then configure the desired storage policy by setting the rotary switch and pressing the mode change push-button on the **bottom-most nodes** in the cascaded configuration, before configuring any of the upper-level nodes. After the bottom-most nodes have been configured and become ready, you can configure the middle nodes. Finally, the top-level node must be configured after all subordinate nodes are ready.

If you wish to change the storage policy for any node or expand the storage capacity of any node by adding more hard disks or SteelVine Storage Reference Design platforms, you must reconfigure each node that has changed in the same bottom-up manner, and you must press the mode change push-button to place the new storage policy into effect. The top-level node must be the last item that is changed on the SteelVine Storage Reference Design platforms. In addition, you must perform some supplemental steps on your host system so the expanded volumes can be recognized at the file system and OS level. Refer to Appendix A, B or C for information about to perform those steps on Windows, Macintosh and Linux systems.

Cascading also allows you to combine multiple SteelVine Storage Processors to create more advanced RAID configurations for high-availability, such as RAID 10 (striping and mirroring), as shown in Figure 10. The top-level node should be set to FAST (RAID 0) mode for striping, and the subordinate nodes should be set to SAFE (RAID 1). In this configuration, the subordinate nodes provide the protection of mirroring, and the top-level node provides the performance benefits of striping. If one of the hard disk drives ever fails, the SAFE volumes from the subordinate nodes will still be valid, and the RAID 10 set will still be available. When the failed hard disk drive is replaced, the subordinate node will automatically rebuild the mirrored volume.

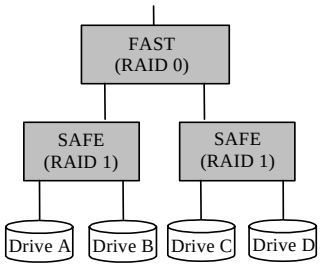


Figure 10 - Using Cascading to create a RAID 10 configuration

Note: *For the first release, you can only use the SteelVine Manager GUI to monitor and configure the storage policy for the top-level node in a cascaded configuration. All subordinate nodes must be configured using the rotary switch or by hard-strapping of the Configuration Pins.*

Drive Locking (not implemented yet)

The Drive Locking feature allows you to protect the contents of the hard disk drives that are connected to your SteelVine Storage Reference Design, so that the contents cannot be accessed by any other user. For the SiI5744, SiI5734 and SiI5723 SteelVine Storage Processors, you can specify your own private password (up to 32 characters) to enable security and lock all of the hard drives on your system (or each drive separately if your SteelVine Storage Reference Design is set to JBOD mode). Once security is enabled and the hard drives are locked, any attempt to access that data will be rejected until you have un-locked the drives by specifying the same password that was entered to lock the drives. If you have a cascaded configuration consisting of multiple SteelVine Storage Processor-based products, you apply the Drive Locking password to the top-level node, and it will be propagated to all subordinate nodes. Similarly, to unlock all of the drives in a cascaded configuration, you must re-enter the password through the top-level node. After the drives are unlocked, they will remain unlocked for the duration of your current session, and you can access the data stored on those hard drives. However, if you turn the power off or disconnect one or more drives, the drives will revert to a locked state. If you are no longer concerned about data security, you can disable the Security feature entirely, and the password will no longer be needed to access your data.

Note that you must remember the password that you specified to initially lock the drives, since you must re-enter that same password to un-lock those drives. If you forget your password, there is no way to recover the data from the locked drives, and the drives will be unusable. If that happens, the only way to continue using those drives is to securely erase and unlock those drives, but any protected data will be permanently lost.

To use this feature, all of your hard disk drives must be capable of supporting the ATA Security Commands. Refer to the list of qualified hard disk drives at http://www.steelvine.com. This feature is only supported with the SiI5744, SiI5734 and SiI5723 SteelVine Storage Processors. The SiI5733 Storage Processor is programmed with an internal unique password that is used to automatically lock and unlock the hard drives, so no user interaction is required.

Backup Button

This feature allows you to launch a pre-configured backup software application by simply pressing a push button on the SteelVine Storage Reference Design. The backup button supports the EMC Retrospect Express (version 6.5 or later) backup application; if that application software is installed on your system, you can associate that backup application to the Backup Button through the SteelVine Manager GUI. When you press the Backup Button on the SteelVine Storage Reference Design, the specified application software will be started, and the LED's on the SteelVine Storage Reference Design will give a visual indication of the progress of the specified backup job and let you know when the backup is completed. Alternatively, you can specify the full pathname for another third-party application program, although any parameters of that application must be specified outside of the SteelVine Manager GUI.

Host System Requirements

PC Systems

- Intel Pentium-III 500MHz equivalent or faster
- Windows 2000, XP, 2003 Server or Windows Vista with the latest Service Packs
- CD-ROM drive
- 64 MB of RAM (minimum)
- 250 MB of free disk space
- Super VGA (800 x 600) or higher resolution display with at least 256 colors
- Mouse or compatible pointing device
- SATA connection: SteelVine Host Bus Adapter card (part number SV-HBA3124 or SV-HBA3132) and associated software drivers, or any other third-party SATA host controller with Port Multiplier support
- USB connection: USB 1.0 or 2.0 direct host connection or USB hub

Macintosh Systems

- PowerMac G5, MacBook Pro or Mac Pro
- MacOS X, 10.4.8 (or later)
- CD-ROM drive
- Mouse or compatible pointing device
- SATA connection: SteelVine Host Bus Adapter card (part number SV-HBA3124 or SV-HBA3132) and associated software drivers, or any other third-party SATA host controller with Port Multiplier support
- USB connection: USB 1.0 or 2.0 direct host connection or USB hub

***Note**: For the latest list of supported third-party hard disk drives and host bus adapters, refer to http://www.steelvine.com*

Configuration Prerequisites

SATA Host Connections

This guide assumes that you have already attached the SteelVine Storage Reference Design to a host computer that has been installed with the SV-HBA3124 or SV-HBA3132 host controller or another third party SATA host controller with Port Multiplier (PM) support. To install and attach the SteelVine Storage Reference Design see steps described in the *SteelVine Storage Reference Design Quick Installation Guide* for your host computer's operating system.

If you use a host controller that does not provide Port Multiplier support:

- The JBOD storage policy is unavailable when configuring the SteelVine Storage Reference Design. Only one disk is available on the host computer.
- Virtual volumes that you create in the Advanced Configuration Wizard must use at least 8 gigabytes (GB) of available system capacity.

USB Host Connections

If you are connecting your SteelVine Storage Reference Design using a USB connection to your host, the USB port should be compliant with USB 1.0, 2.0 or connected to a USB hub.

Changing Host Connections

The SiI5744 and SiI5734 support both USB and SATA host connections, although only one connection can be attached at any given time. For the best data transfer performance, you should always use the SATA host connection.

If it becomes necessary to change the host connection between SATA and USB, the host computer system and the SteelVine Storage Reference Design should both be powered down prior to making the host connection change to avoid any potential data loss or corruption. After changing the host connection, all items can be powered-up to resume operation with the new host connection.

Disconnecting a USB Device

USB 2.0 external devices provide support for "plug & play" connection, so that your USB storage device can be connected and disconnected while the computer is running. To prevent data loss or other failures, you must follow these steps when disconnecting your USB 2.0

storage device from your host computer system. Once the physical USB device is disconnected, any volumes that are associated with that device will become unavailable. On Windows systems, the SteelVine Manager GUI and daemon software must be stopped before any devices can be disconnected.

Windows Systems

1) Close the SteelVine Manager GUI and exit the icon in the Notification Tray.
2) Stop the SteelVine daemon by selecting **Start → Program Files → Silicon Image → 57XX SteelVine → Control → Stop SteelVineService**.
3) Click on the **Eject** icon (a small green arrow over a hardware image) in the System Tray located in the lower right-hand side of your screen

4) A message will appear listing all of the devices that the Eject icon controls. Click on the "**Safely remove USB Mass Storage Device**" item.
5) The following message then appears: "**Safe to Remove Hardware**". You can now safely disconnect the device from your computer.

Note: *If your host USB adapter does not support this feature, the device should be disabled using the Device Manager or your system should be shut down cleanly and powered off before disconnecting the USB device.*

Macintosh Systems

You must un-mount the hard drive system by dragging the hard drive icon to the trash before disconnecting it or powering it down.

Linux Systems

You must manually un-mount the volume using the appropriate Linux command for your specific system type before disconnecting it.

Hard Disk Drive Hot-Plug and Unplug

When using a SATA host connection, the hard disk drives can be hot-plugged or hot-unplugged while the system is running. However, to avoid data corruption or loss, care should be taken to ensure that the host system is not currently using any drive that is about to be hot-unplugged.

When using a USB host connection, the hard disk drives should not be hot-plugged or hot-unplugged while the system is running. Instead, you should eject the drives or shut down your host system before connecting or disconnecting any hard disk drives.

ATAPI Device Limitations

The following limitations apply when connecting an ATAPI device to a SATA port of the SteelVine storage processor:

- ATAPI devices are only supported in the JBOD mode; they are not supported in virtual drive configurations.
- The GUI communication requires that the SteelVine storage processor be configured as JBOD with a hard disk drive connected to SATA port 0 and an ATAPI device connected to SATA port 1.
- The GUI will not communicate with the SteelVine storage processor when in JBOD configuration and only ATAPI devices are connect to one or both of the SATA ports on the SteelVine processor.

2 Getting Started

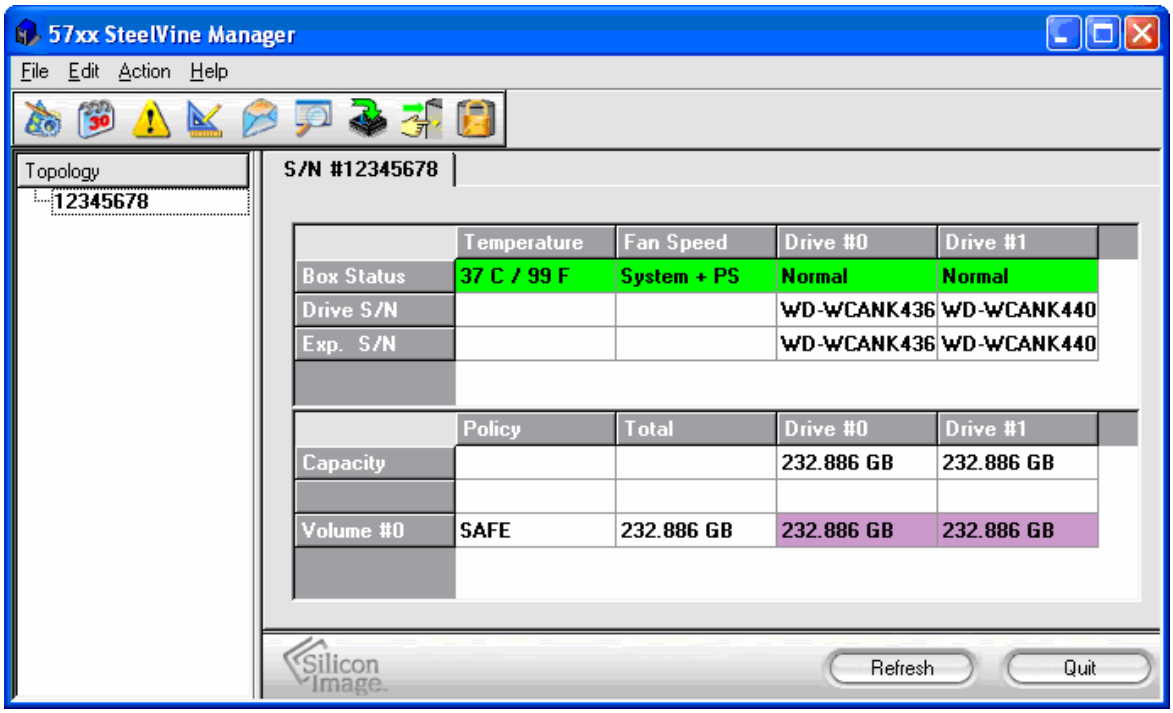
Starting the SteelVine Manager

Before you begin, be sure that the SteelVine Manager software has been installed according to the instructions in the *Quick Installation Guide* for your host computer type.

MS Windows

Click **Start → Program Files → Silicon Image → 57XX SteelVine → SteelVineManager**. Once started, the SteelVine Manager Application icon can be found in the Notification Tray located at the bottom right hand corner of the screen. Double click the notification tray icon to open the SteelVine Manager GUI status window. The SteelVine Manager icon remains active in the notification tray even if you close the SteelVine Manager window. It can be closed by right-clicking on the icon and selecting "**Exit**".

The SteelVine Manager starts with the Status Window visible so you can monitor the SteelVine Storage Reference Designs connected to the host computer. Up to four SteelVine Storage Reference Designs can be managed through a single session. When the SteelVine Storage Reference Design is set to GUI mode, you can access the Basic Configuration Wizard from the Status window. From there, you can optionally use the Advanced Configuration Wizard to create multi-volume configurations.

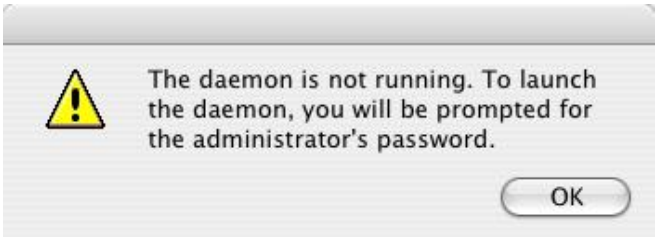


Select menu options and follow the instructions in the remainder of this guide to configure SteelVine Storage Reference Designs. When prompted, enter the administrative password (default password is **admin**).

Mac OS X

The SteelVine Manager software is installed in the **Applications > Utilities > SteelVine** folder. Before the SteelVine Manager starts, the launch sequence searches for an active daemon and launches it if the daemon is not active.

1. Launch the Finder and navigate to the **Applications > Utilities > SteelVine** folder. Double-click the **SteelVine** icon to start the SteelVine Manager.
2. If the launch sequence does not find the daemon, a warning message appears. Click **OK**.

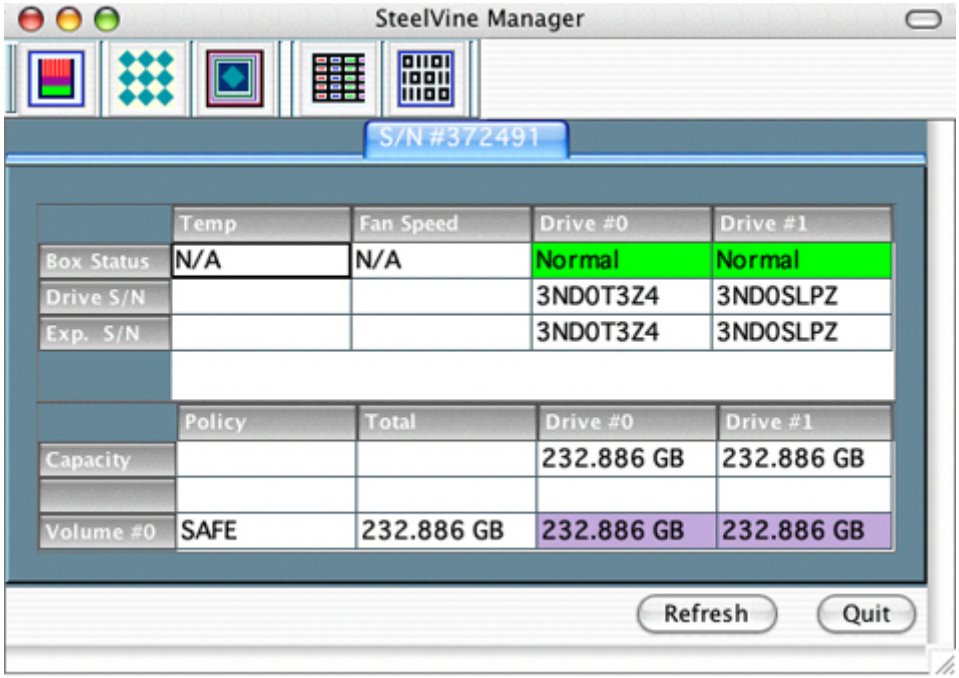


3. Enter the system administrator (root) password and click **OK**.

4. A notice appears as the launch sequence attempts to start the daemon. Click **OK**.

If the daemon fails to start, an error appears. Follow the recommendations in the error message to correct the problem.

5. Monitor the status of SteelVine Storage Reference Designs on the Status window.



<need a new screen capture when the Mac version is available>

6. Select menu options and follow the instructions in the remainder of this guide to configure SteelVine Storage Reference Designs. When prompted, enter the administrative password (default password is **admin**).

Linux

Use the following procedure to launch the SteelVine Manager on a Linux system.

1. Change to the directory in which the SteelVine Manager GUI and daemon software was installed (such as **/usr/local/SiliconImage**)
2. Start the daemon by entering the command:
   `./SiI57XX -e`
3. Open a new terminal window and start the GUI by entering the command:
   `./SiI57XXUI`

<need a screen capture when the Linux version is available>

Introducing the SteelVine Manager

The SteelVine Manager starts with the Status window visible so you can monitor the SteelVine Storage Reference Designs. The Status-only mode is entered when the rotary switch is in the JBOD, BIG, FAST, SAFE, SAFE33, or SAFE50 mode. In Status only mode, you are not permitted to change the configuration from the GUI. The only possible way to change the configuration is to change the rotary switch setting.

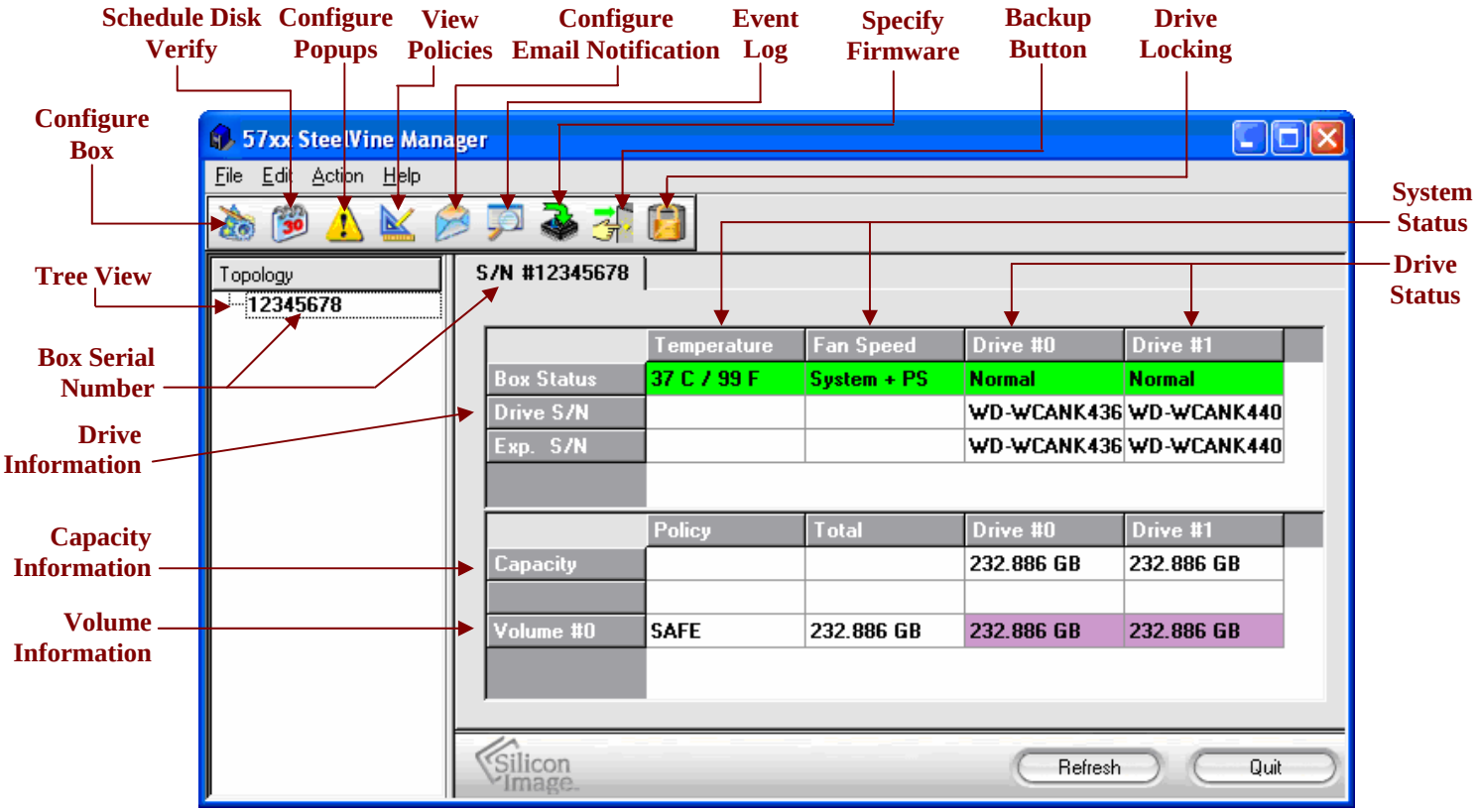


Table 2 - Sections of the Status Window

Status Cells	Description
Topology Section	
Tree View	Shows the hierarchical structure of multiple SteelVine Storage Processors when using Cascading **(only the top-level node is shown in the initial release)**
System Status Section	
Temperature	Indicates the current temperature of the SteelVine Storage Reference Design. The field displays "**N/A**" if there is no temperature sensor installed in your storage enclosure.
Fan Speed	Indicates the system fan state. The field displays "**N/A**" if there is no fan speed sensor installed in your storage enclosure.
Drive Status Section	
Box Status	Shows the drive state: Normal, Rebuilding, Verifying, Unplugged, Needs Rebuild, New Drive, Wrong Slot, Use Bigger Drive, Mismatch, Not Readable or Unavailable.

Status Cells	Description
Drive S/N	Shows the unique serial number assigned by the disk manufacturer.
Exp. S/N	Shows the expected serial number. The SteelVine Storage Reference Design compares the **expected** and **actual** drive serial numbers to detect when a drive's status changes.
Security	Shows the status of the Drive Locking security feature (refer to Chapter 10 Drive Locking on page 66 **(not implemented yet)**.
Capacity Information Section	
Policy	Shows the storage policy configured for each volume.
Total	Shows the combined capacity of the volume.
Drive #	Shows capacity information for each hard drive.
Capacity	Shows the amount of storage space (in GB) available on each hard drive.
Volume	Shows the total volume capacity and the drive capacities assigned to each volume.

Table 3 - File Menu on the Status Window

File Menu Item	Description
Change Password	Opens a dialog to establish a new password.
Scan Devices	Refreshes the status details presented on the Status window.
Change Connections	Opens a dialog to make remote connections.
Quit	Exits the SteelVine Manager GUI (Windows systems only)

Table 4 - Edit Menu on the Status Window

Edit Menu Item	Description
Configure Box	Opens the Basic Configuration Wizard.
Schedule Disk Verify	Schedule a disk Verify activity (enabled only in SAFE, SAFE33 or SAFE50 modes)
Configure Pop-Ups	Configure the Pop-Up messages.
View Policy Settings	Display the Rebuild policy settings (enabled only in SAFE, SAFE33 or SAFE50 modes)
Setup Email Notification	Opens the Setting-up Email Notification dialog.
Event Log	Opens the Event Log viewer.
Specify Firmware	Opens the Firmware Selection dialog.
Backup Button	Open the Accessing the Backup Button Dialog dialog.
Drive Locking	Opens the Accessing the Drive Locking Dialog dialog. **(not implemented yet)**

Table 5 - Action Menu on the Status Window

These selections are only available if one or more SAFE volumes have been configured on the system.

Edit Menu Item	Description
Start Rebuild	Initiates a Rebuild to the target drive
Start Verify	Initiates a Verify activity on the selected drive
Abort Rebuild	Abort the rebuild process (only selectable when a Rebuild operation is active)
Abort Verify	Abort the Verify process (only selectable when a Verify operation is active)

Table 6 - Toolbar Buttons on the Status Window

Button	Tooltip	Description
	Configure Box	Opens the Basic Configuration Wizard. (appears only when using GUI Configuration mode)
	Schedule Disk Verify	Schedule a disk Verify activity. (appears only when one or more SAFE volumes exist)
	Configure Pop-Ups	Configure the Pop-Up messages.
	View Policy Settings	Shows the Rebuild Policy settings that are defined by the GPI pins (appears only when one or more SAFE volumes exist)
	Show Event Log	View the Event Log.
	Specify Firmware	View the current version or download an updated version of the SteelVine Storage Processor firmware.
	Email Notification	Configure the operation of email message notification.
	Backup Button	Configure the third party backup application that should be launched when the Backup Button is pressed on the SteelVine Storage Reference Design.
	Drive Locking	Enable/disable the hard drive data security mechanism **(not implemented yet)**.

3 Basic Configuration

This section describes the Basic Configuration Wizard and explains how to configure volumes (virtual drives).

A Look at the Basic Configuration Wizard

The SteelVine Storage Processors provide several methods for defining the configuration. When the rotary switch (found on the back of the device) is set outside the visible presets [SAFE, SAFE33, SAFE50, FAST, BIG or JBOD], the Basic Configuration Wizard is accessible from the Status Window. When the rotary switch is set to one of the default settings, the configuration screen and options are not accessible and the volumes are defined based upon a selected storage policy. You cannot modify the volume counts or the capacities.

To access the Basic Configuration Wizard, click on the **Configure Box** icon along the top of the SteelVine Manager Status Window.

To protect against unintended changes, the SteelVine Manager prompts for a password the first time you access the Wizard. Enter the administrator password. The default password is **admin**. (See Change the Password on page 74 for additional information on password management.)

The Basic Configuration Wizard dialog will appear (see Figure 11 below).

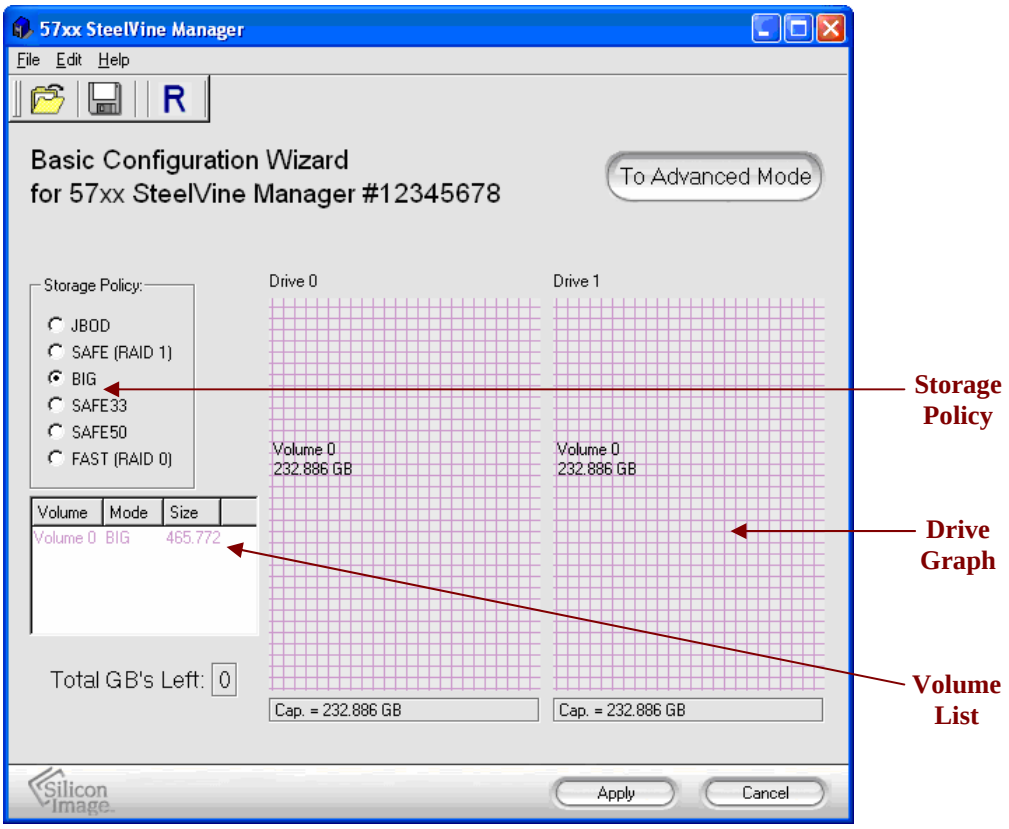


Figure 11 - Basic Configuration Wizard

Table 7 - Sections of the Basic Configuration Wizard

Wizard Section	Description
Storage Policy	Identifies available SteelVine Storage Policies to assign to the SteelVine Storage Reference Design configuration.
Volume List	Shows Volume, Mode (storage policy), and Size details for logical volumes. The "**Total GB's Left**" field (below the volume list) shows the remaining capacity in gigabytes for all hard drives.
Drive Graph	Displays disk space for each hard drive. Storage capacity that is allocated to the same volume appears in a matching color. A hatch pattern indicates a proposed configuration and a solid block indicates an existing volume. The "**Cap**" field (below each drive in the drive graph) shows the maximum capacity in gigabytes for that hard drive.

Table 8 - Toolbar Buttons on the Basic Configuration Wizard

Button	Tooltip	Description
	Read a configuration from a file	Reads a saved configuration into the Basic Configuration Wizard so you can apply the configuration to the SteelVine Storage Reference Design.
	Write configuration from system to a file	Save a Configuration File to a file on the host computer.
	Restore configuration to last commit	Cancels proposed changes.

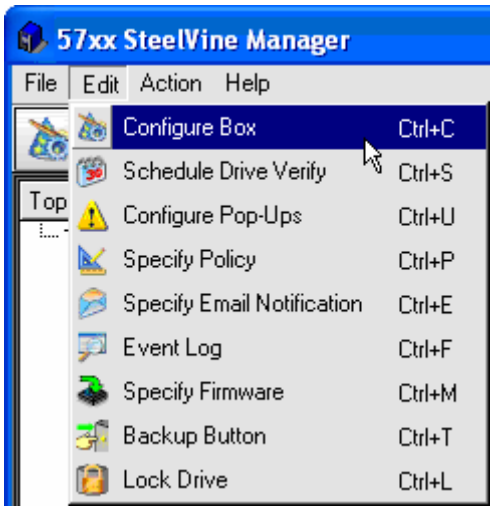
Table 9 - Command Buttons on the Basic Configuration Wizard

Button Label	Description
To Advanced Mode	Opens the Advanced Configuration Wizard. This option is only available if the Advanced Configuration mode is enabled for you system. If you are using a SATA host connection, this option is only available if your SATA controller is PM-aware. For more information, refer to Customizing the SteelVine Manager on page 82.
Apply	Submits configuration changes to the SteelVine Storage Reference Design, closes the Wizard, and displays the updated configuration on the Status Window.
Cancel	Aborts the changes and closes the Wizard.

Configure Volumes

Note: Before reconfiguring the SteelVine Storage Reference Design, you must delete any previously defined partitions. See Partition a Volume for details.

1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.



2. When prompted, enter the administrator password. The default password is **admin**.

3. Select a storage policy in the **Storage Policy** frame.

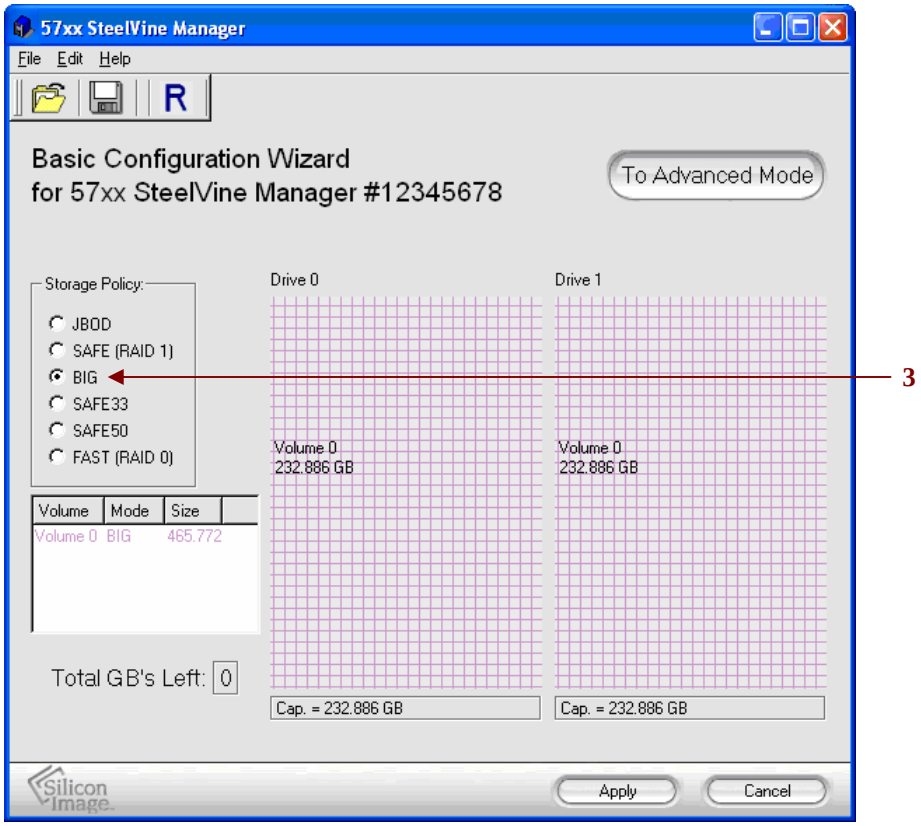
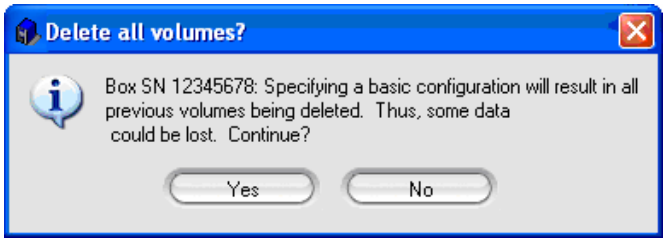


Table 10 - Basic Mode Policies

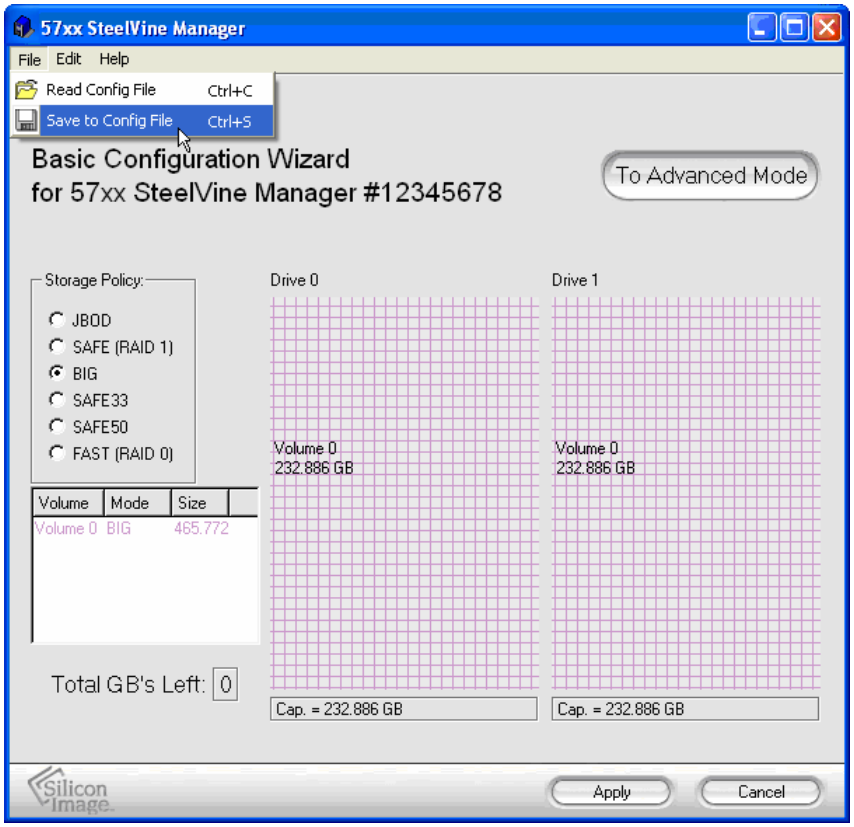
Policy	Description
JBOD (bypass)	Creates a logical volume for each physical hard drive. Available only for SATA host controllers that provide Port Multiplier support, and only available for the top-level node of a cascaded configuration.
SAFE (RAID 1)	Creates one volume. One hard drive mirrors the other. The system automatically restores data redundancy to a **SAFE** volume when an offline drive comes back online.
BIG	Concatenates all hard drives into a single volume.
SAFE33	Creates one SAFE volume that has one-third of the available storage capacity of the smaller hard drive and one BIG volume that has the remaining capacity.
SAFE50	Creates one SAFE volume that has one-half of the available storage capacity of the smaller hard drive and one BIG volume that has the remaining capacity.
FAST (RAID 0)	Creates one volume that is striped across two hard drives to expose double the capacity of the smaller drive.

Note: *Only the Storage Policies that are supported by your specific SteelVine Storage Processor chip-type will appear in the list. If you are using a SATA host connection, the SAFE33 and SAFE50 selections will only be available when the host SATA controller is Port-Multiplier Aware.*

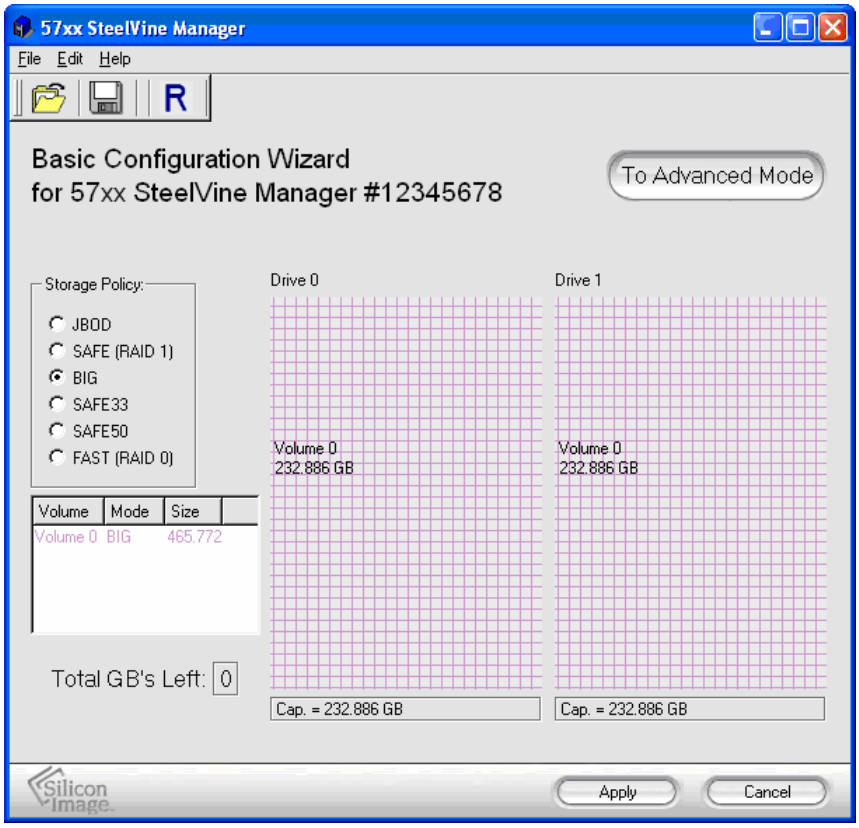
4. When prompted to acknowledge that the configuration change may result in data loss, click **Yes** to accept the configuration.


Delete all volumes?
Box SN 12345678: Specifying a basic configuration will result in all previous volumes being deleted. Thus, some data could be lost. Continue?
Yes
No

5. Select **Save to Config File** from the File menu or click the **Write configuration for system to a file** toolbar button to save the configuration.



6. Click **Apply** to create the selected configuration, close the Wizard, and display the volumes in the Status Window (may take up to one minute to display).



7. Partition the configured volumes to complete the implementation. Refer to Chapter 5 Partitioning Volumes for details.

4 Advanced Configuration

This section describes how to use the Advanced Configuration Wizard to apply more than one storage policy to volumes on the SteelVine Storage Reference Design. This mode is entered by selecting the GUI-only position on the rotary switch, if the Advanced Configuration feature is enabled for your system (refer to Chapter 1 Introducing the SteelVine Storage Appliance). In addition, if you are using a SATA host connection, your SATA controller must be Port Multiplier aware.

Why Advanced Configuration?

The Basic Configuration Wizard provides predefined storage policies to quickly configure the SteelVine Storage Reference Design. Each predefined storage policy allocates the total system capacity to the selected **JBOD**, **SAFE**, **FAST**, or **BIG** storage policy. The SAFE33 and SAFE50 storage policies are not available in the Advanced Configuration Wizard (although equivalent SAFE and BIG volumes can be configured manually).

Using the Advanced Configuration Wizard, you can configure two volumes, (with the same or different storage policies), on the two hard drives. The following configuration options are possible, where each of the two volumes is allocated some portion of the total system capacity:

- Two SAFE volumes that are mirrored from one hard drive to the second drive.
- Two FAST volumes that are striped across the two hard drives.
- Two BIG volumes that are spread across the two hard drives (part of each drive is concatenated, or added to, a portion of the second drive).
- One **FAST** volume that is striped across the two hard drives and one **BIG** volume that is allocated the remaining capacity on both drives. The reversed configuration—one **BIG** volume and one **FAST** volume—is also possible.
- One **FAST** volume that is striped across the two hard drives and one **SAFE** volume that is allocated the remaining capacity (split between the volume and its mirror twin). The reversed configuration—one **SAFE** volume and one **FAST** volume—is also possible.
- One **BIG** volume that is spread across the two hard drives (part of each drive is concatenated, or added to, a portion of the second drive) and one **SAFE** volume that is allocated the remaining capacity (split between the volume and its mirror twin).

Note: *You cannot combine the **JBOD** and **SAFE** storage policies. A JBOD volume consumes one entire drive and a SAFE volume requires one drive for the volume and a second drive for its mirror twin. You also cannot combine the **JBOD** and **FAST** storage policies. JBOD consumes an entire drive and a Fast volume requires two drives for striping.*

If multiple volumes are created for a subordinate node in a cascaded configuration, only the first volume will be visible to the node above it. Similarly, if multiple volumes are created on a standalone Storage Processor or the top-level node of a cascaded configuration with a SATA host connection that is not PM-aware, only the first volume will be visible to the host.

A Look at the Advanced Configuration Wizard

The Advanced Configuration Wizard is an extension of Basic mode that allows you to create two volumes (virtual drives) on each physical hard drive.

Figure 12 - Advanced Configuration Wizard

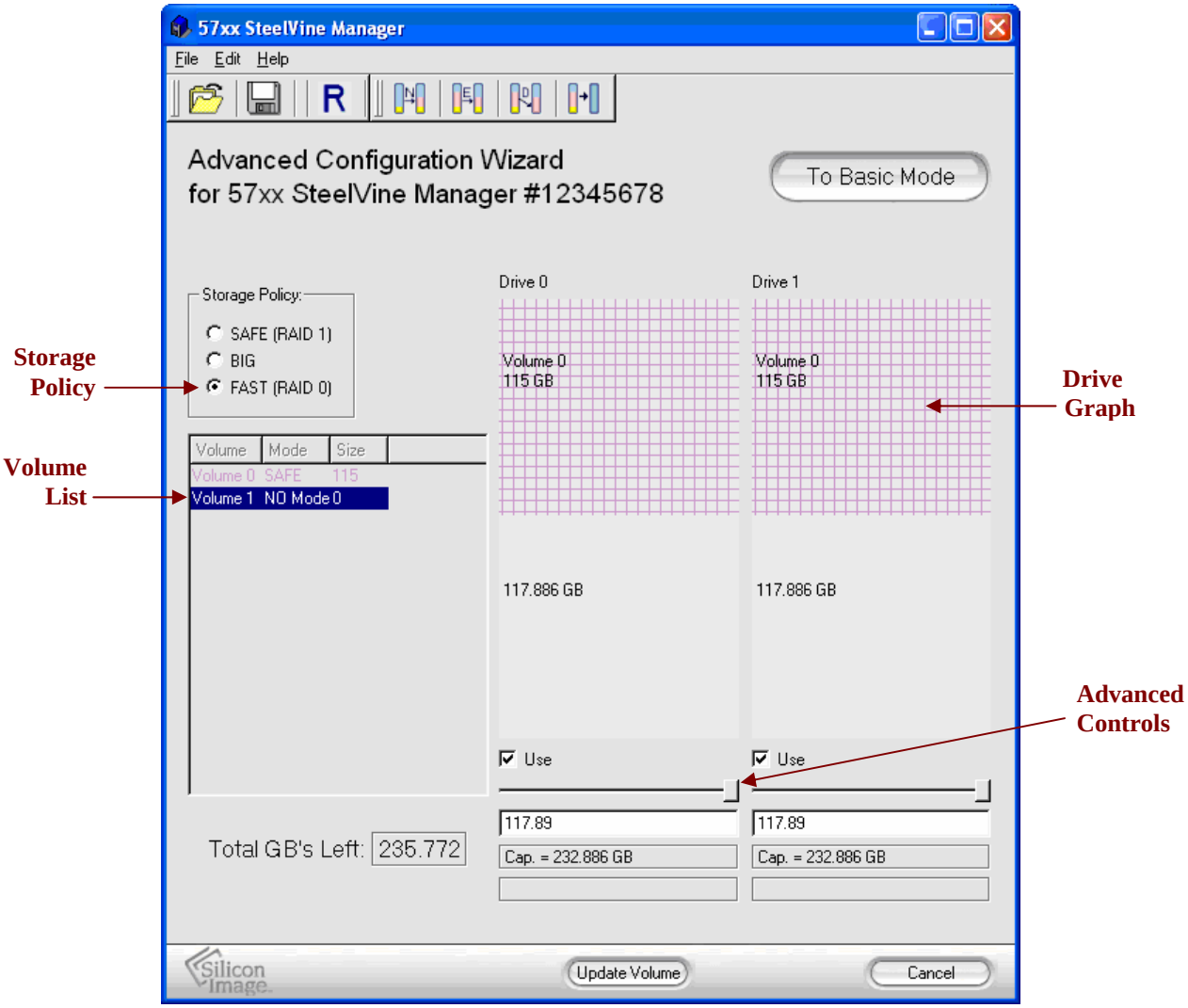


Table 11 - Sections of the Advanced Configuration Wizard

Section	Description
Storage Policy	Shows the available SteelVine Storage Policies that you can assign to volumes. The options are enabled after you create a new volume or select an existing volume to edit.
Drive Graph	Displays disk space for each hard drive. All space allocated to the same volume appears in a matching color. A hatch pattern indicates a proposed configuration and a solid block indicates an existing volume.
Volume List	Shows Volume, Mode (storage policy), and Size details for currently configured volumes. Select a volume to edit or delete. The 'Total GB's Left' field below the volume list shows the remaining capacity in gigabytes for all the hard drives.
Advanced Controls	Permit volume creation and modification on each hard drive: Use check box indicates drive membership within a volume. Slider specifies capacity allocated to a volume. Text field shows the capacity specified by manipulating the slider. Cap field shows maximum capacity for the hard drive. Vol# shows the hard drive capacity allocated to the noted volume.

Table 12 - Toolbar Buttons on the Advanced Configuration Wizard

Button	Tooltip	Description
	Read a configuration from a file	Reads a saved configuration into the Advanced Configuration Wizard so you can apply the configuration to the SteelVine Storage Reference Design. Available in Basic and Advanced modes.
	Write configuration for system to a file	Save a Configuration File to a file on the host computer. Available in Basic and Advanced modes.
	Restore configuration to last Commit	Cancels proposed changes. Available in Basic and Advanced modes.
	Create a new volume	Creates a new volume on which to set the SteelVine Storage Policies and capacity. You can create 2 volumes on each hard drive.
	Edit selected volume	Permits the storage policy and capacity of an existing volume to be modified.
	Delete selected volume	Deletes the volume that is currently selected in the volume list.
	Delete all volumes	Deletes all configured volumes.

Table 13 - Command Buttons on the Advanced Configuration Wizard

Button	Description
To Basic Mode	Opens the Basic Configuration Wizard.
When configuring a volume (create a new volume or edit a selected volume)	
Update Volume	Applies the selected storage policy to the selected portion of a hard drive as a proposed configuration.
Cancel	Aborts the in-progress changes and returns the Wizard to the point where you can perform different advanced configuration functions.
After configuring a volume	
Apply	Submits configuration changes to the SteelVine Storage Reference Design, closes the Wizard, and displays the updated configuration on the Status Window.
Cancel	Aborts the in-progress changes and closes the Wizard.

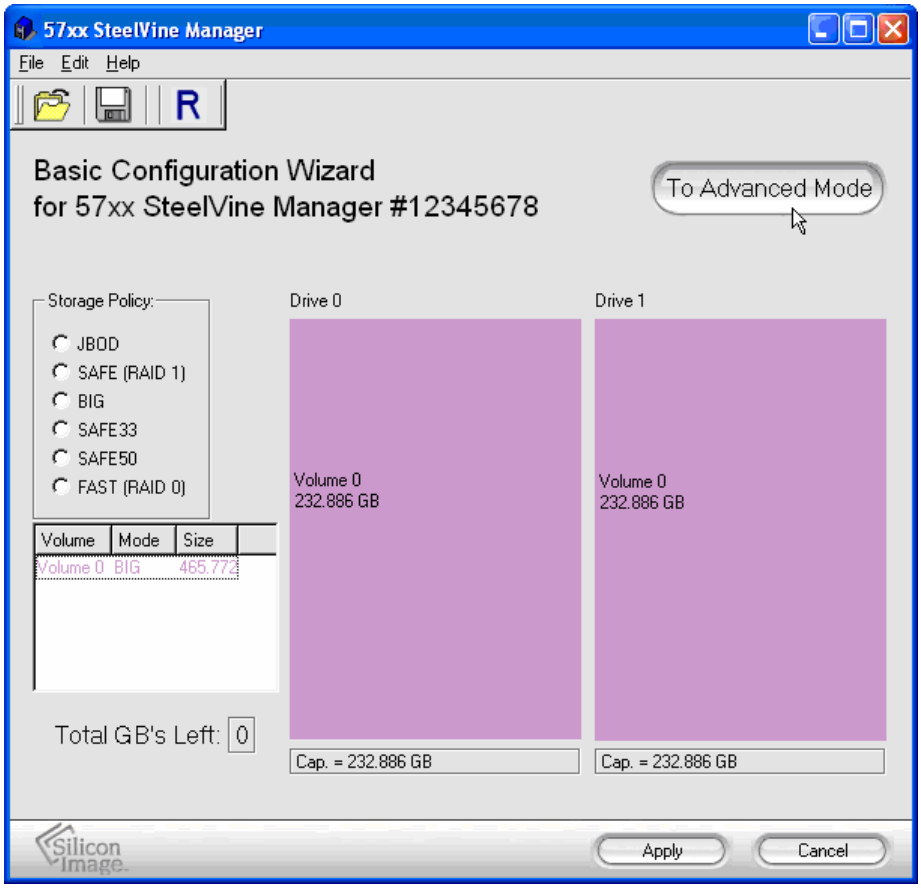
Configure Multiple Volumes

The Advanced Configuration Wizard allows many combinations of storage policies and capacities. This procedure illustrates modifying a basic **BIG** configuration so that it contains two volumes, one **BIG** and one **FAST**, that use capacity on two drives. The same sequence of steps applies to any combination you choose to implement; only the storage policy and capacity allocation vary for different configuration options.

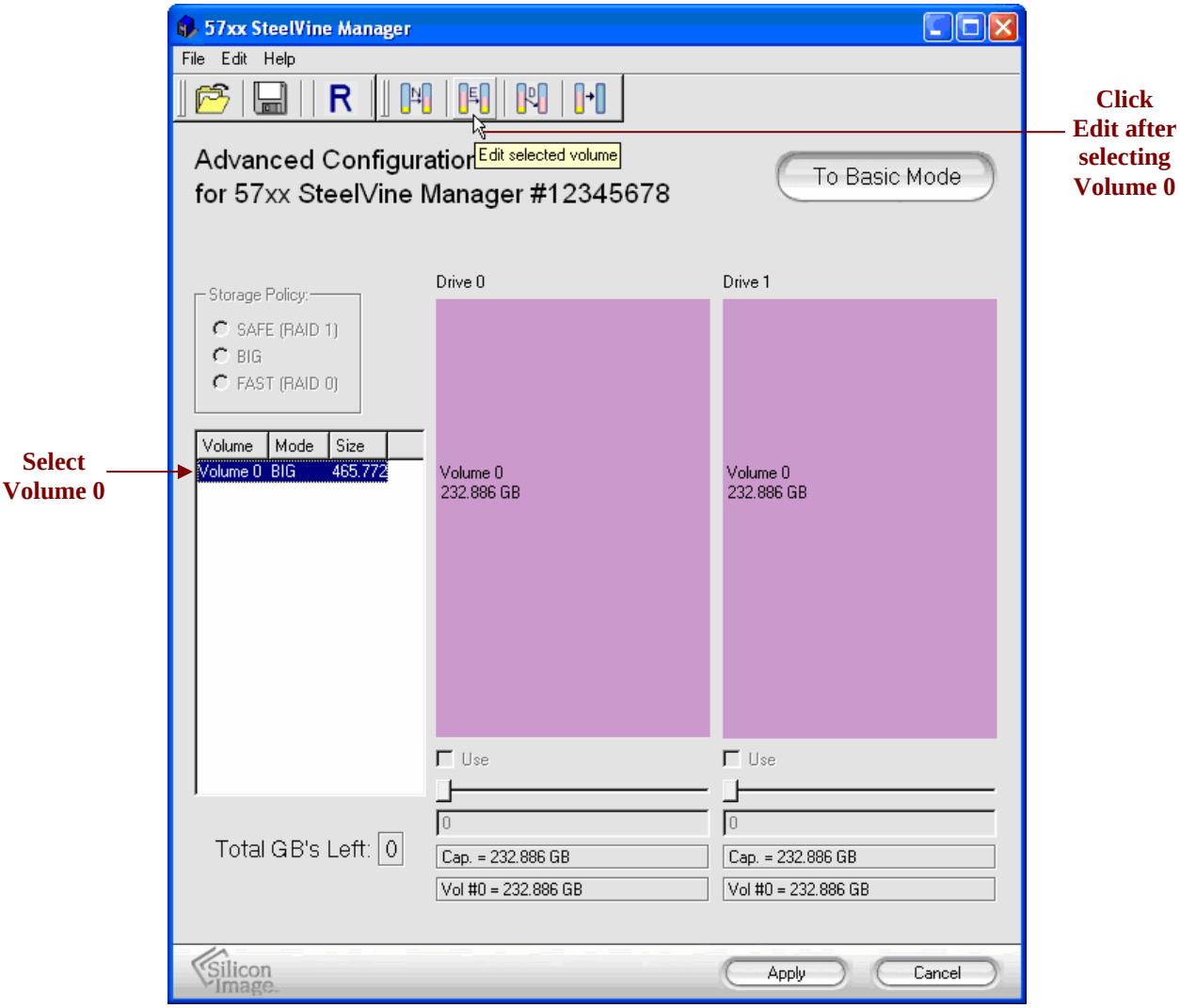
Note: *Before reconfiguring an existing SteelVine Storage Reference Design with a new configuration, back up your data and use the Disk Management utility for your operating system to delete all partitions on SteelVine drives. After you configure and partition the new volumes, restore the backed-up data to the new configuration.*

1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.

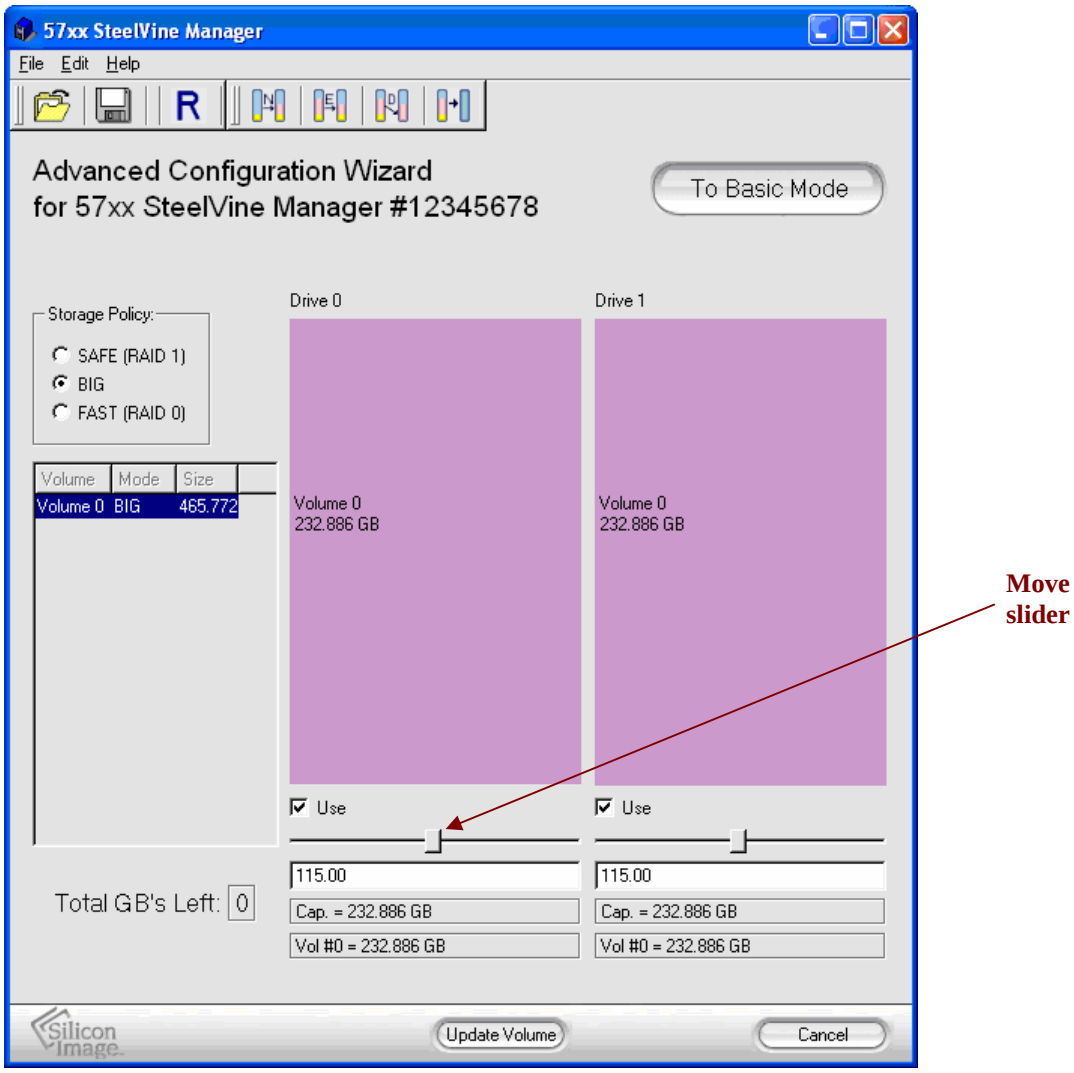
2. From the Basic Configuration Wizard, click "**To Advanced Mode**" to open the Advanced Configuration Wizard.



3. Select the **BIG** Volume 0 in the volume list and click the **Edit Selected Volume** toolbar button.

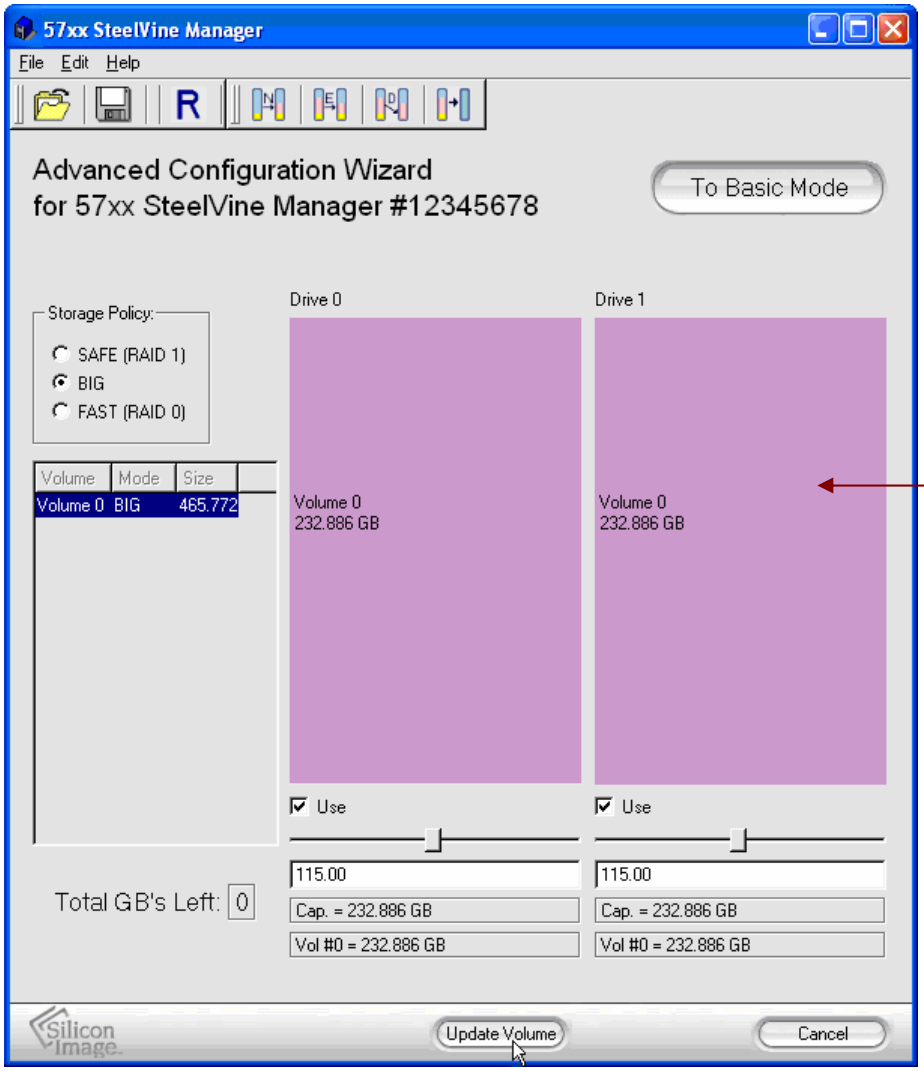


4. Move the slider below Drive 0 to the left to change the **BIG** volume's capacity allocation from the entire hard drive to a portion of the drive. This frees capacity for the second volume.



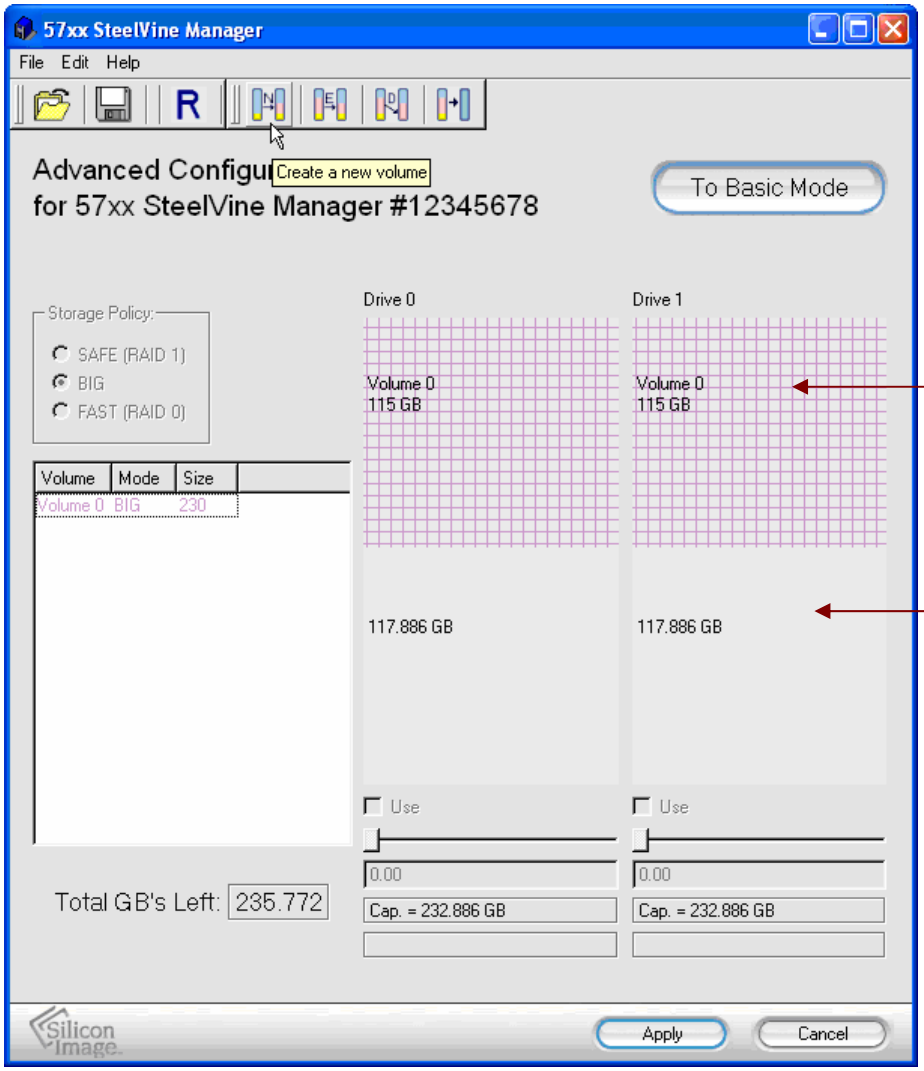
Tip: *Click to the right or left of the slider within the slider's channel to make half-GB changes.*

5. Click **Update Volume**.



Bright, solid colors identify saved volumes

6. Click the **Create a New Volume** toolbar button.



Cross-hatches identify allocated space for updated volumes (not yet saved).

Light solid colors identify unallocated disk space.

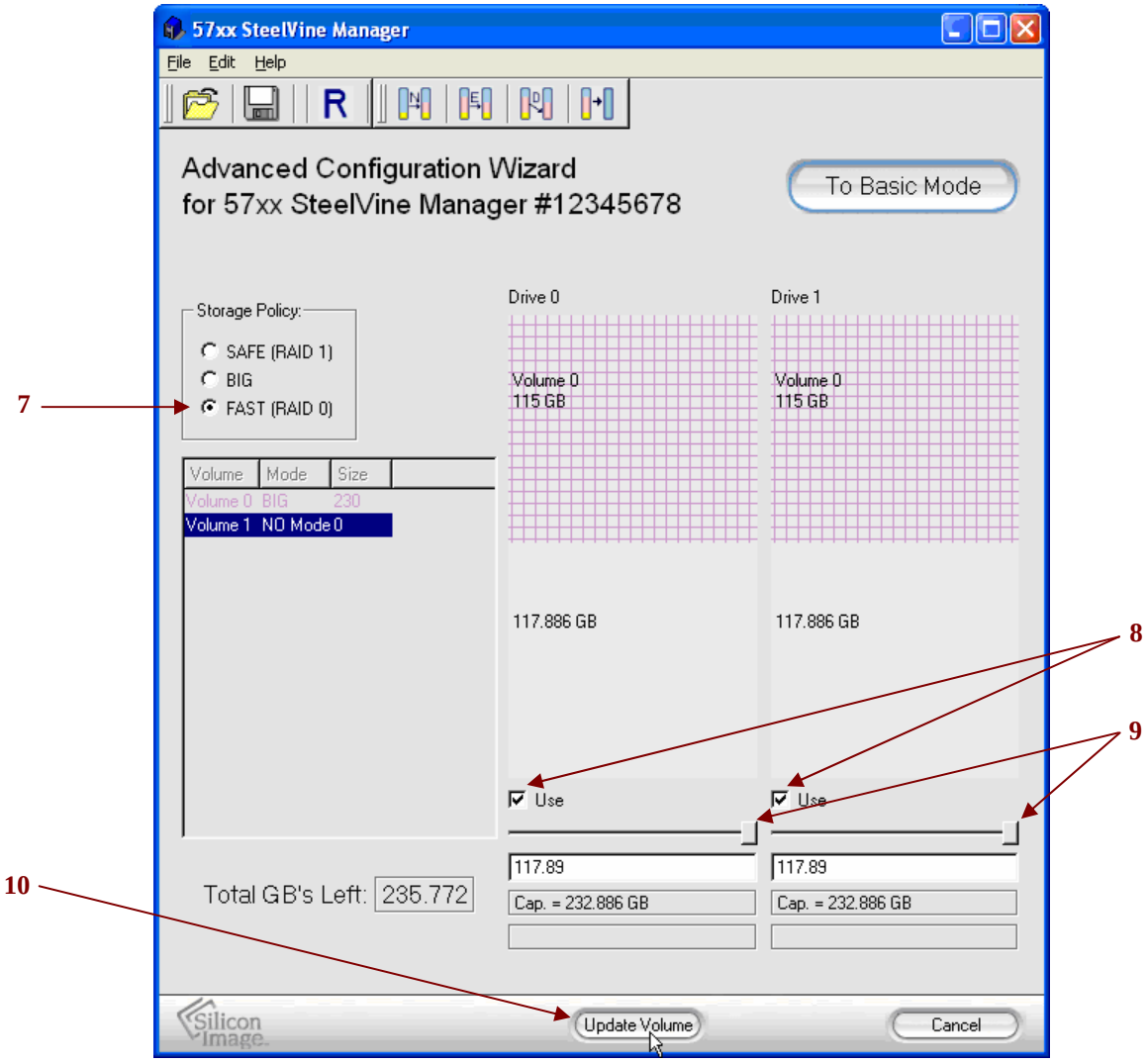
7. Select the **FAST** radio button in the Storage Policy section.

Note: *Only the Storage Policies that are supported by your specific SteelVine Storage Processor chip-type will appear in the list.*

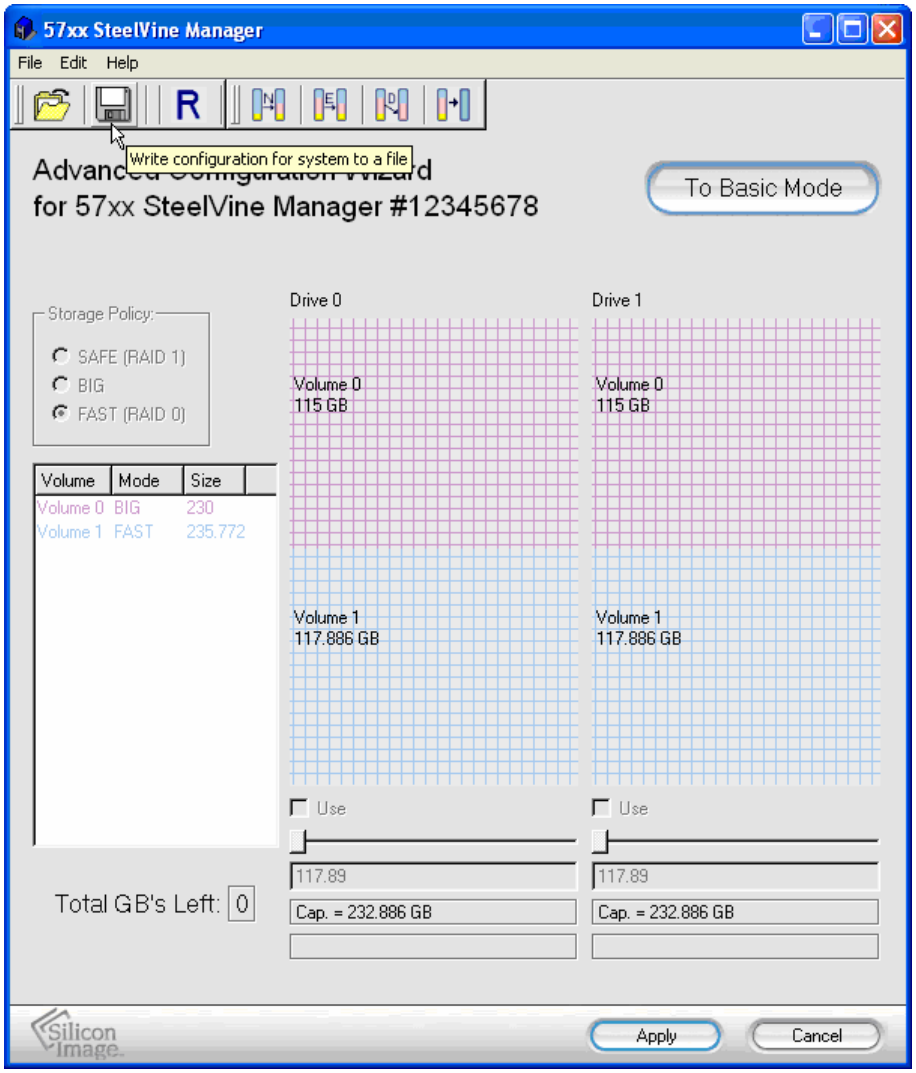
8. Select the **Use** check box below both Drive 0 and Drive 1 because **FAST** volumes are striped across two hard drives.
9. Verify the sliders below both drives automatically moved all the way to the right to allocate the remaining capacity on the two drives to the **FAST** volume.

Note: *You can allocate less than the total remaining capacity to the second volume. If you do that, however, the capacity is unavailable and unused.*

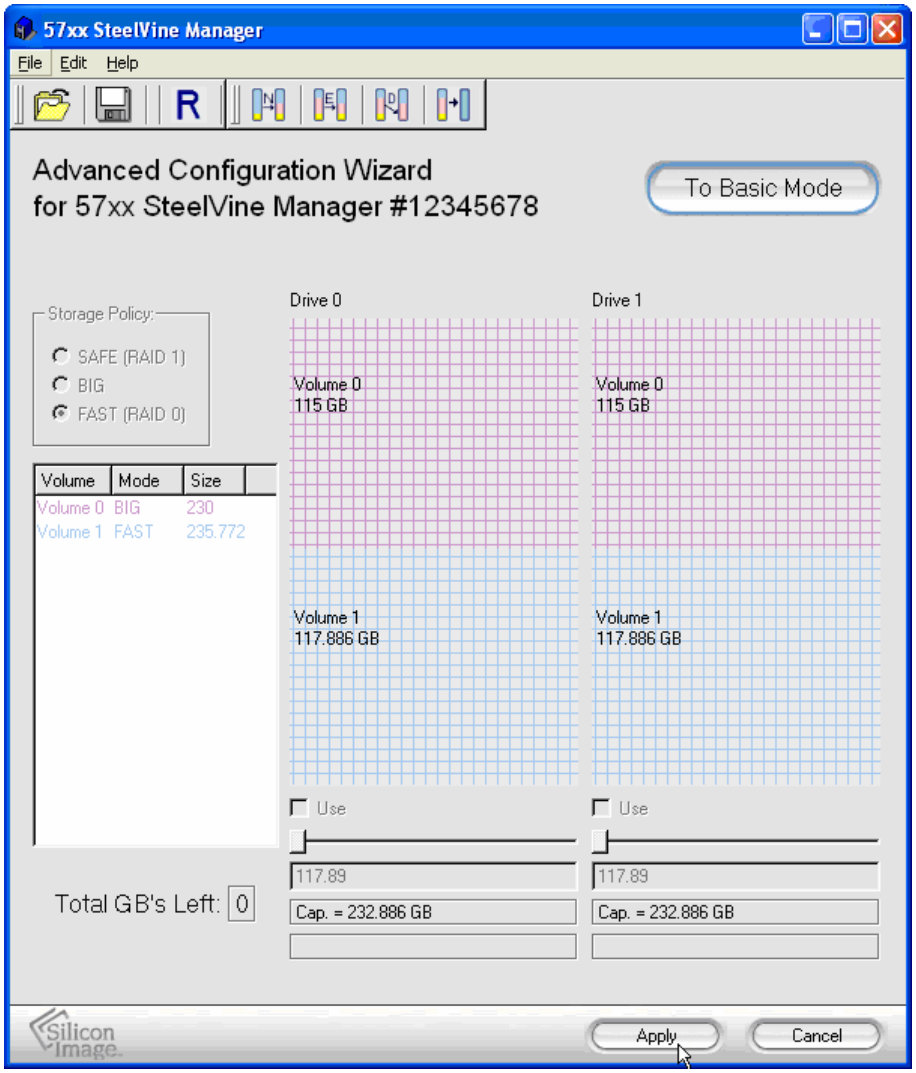
10. Click **Update Volume**.



11. Click the **Write Configuration for System to a File** toolbar button to Save a Configuration File.



12. Click **Apply** to create the multi-volume configuration, close the Wizard, and display the volumes in the Status Window (within approximately one minute).



13. Partition the configured volumes to complete the implementation. See Chapter 5, Partitioning Volumes for details.

5 Partitioning Volumes

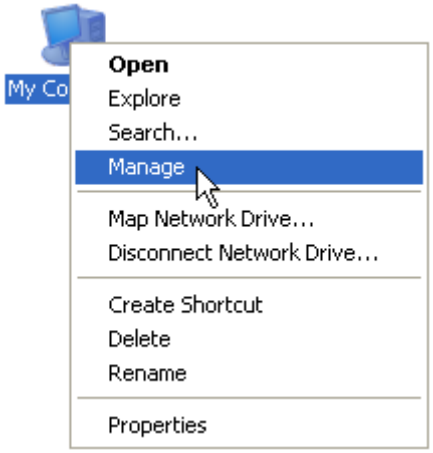
This section explains how to partition volumes after configuring them in the SteelVine Manager GUI. You must partition volumes for the host computer's operating system before you can store data on the volumes. Refer to the operating system's documentation for further guidance.

Partition a Volume

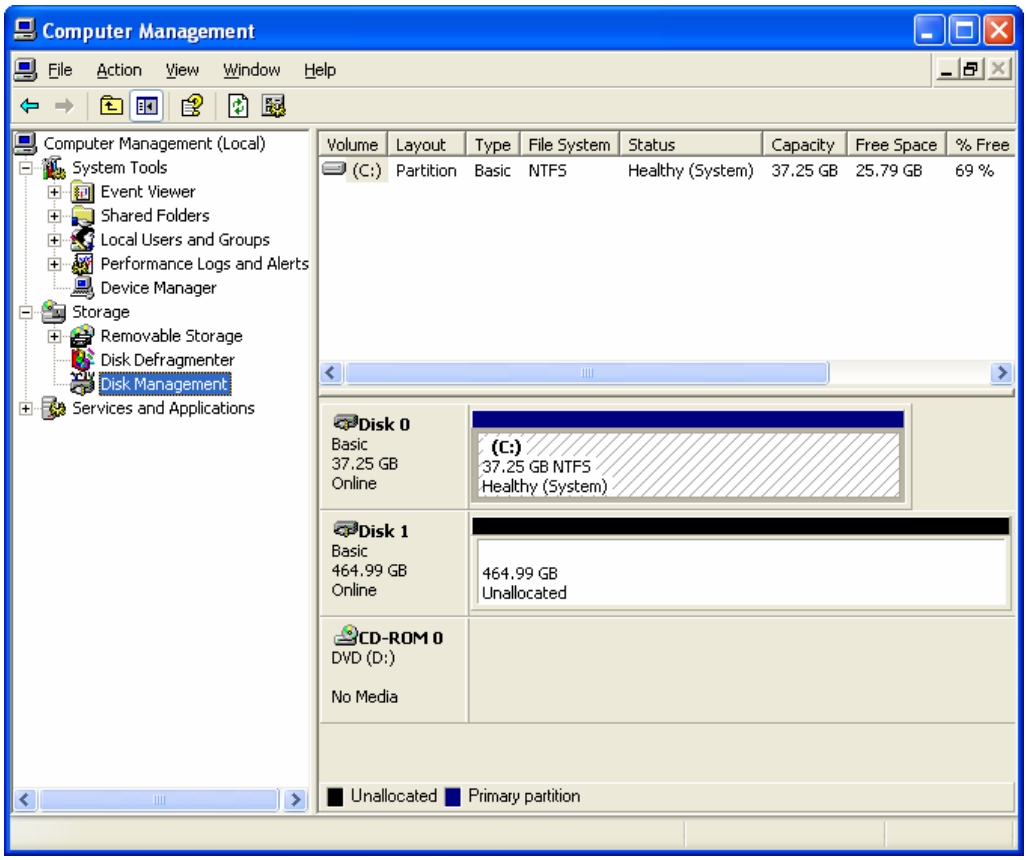
MS Windows

Important: *Before reconfiguring a volume, back up your data and delete previously defined SteelVine Storage Reference Design partitions. If no hard disk drives are connected to the SteelVine Storage Processor, the SteelVine Processor device (the "**Not Initialized**" disk with no capacity allocated to it) will appear. Do not initialize or modify that device.*

1. Right-click the **My Computer** icon on your desktop and select **Manage** from the pop-up window.



2. Select **Disk Management** under **Storage** to open the Windows Disk Manager. This example illustrates the **BIG** storage policy, which concatenates the capacity of all hard drives connected to the SteelVine Storage Reference Design.



Every disk should appear with the word "**Basic"**, a size value that shows the available storage capacity, and a status of "**Online**". Instead of **Basic**, a disk could appear **Unknown**, **Dynamic**, or **Not Initialized**.

If the disk appears as "**Unknown**", right-click the disk icon and select **Write Signature**. A window opens with the selected disk (all Unknown disks may appear in this window). Make sure the box next to each disk is checked and click **OK**. The disk should now be marked as a **Basic** disk.

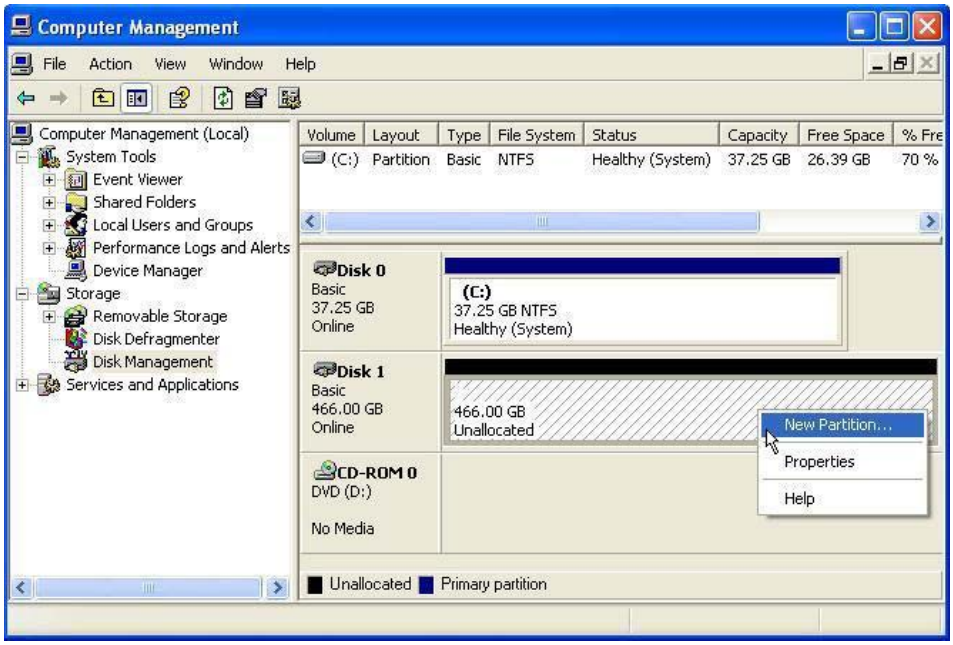
If a disk appears as "**Dynamic**", right-click the disk icon, and select **Revert to Basic Disk**. Within a few seconds, the disk should be marked as a **Basic** disk.

If a disk is marked "**Not Initialized**", right-click the disk icon and select **Initialize Disk**. An additional dialog box appears allowing you to select which disks to initialize. Uncheck the SteelVine Processor Disk item and click **OK**. Within a few seconds, the selected disk(s) should be marked as a **Basic** disk.

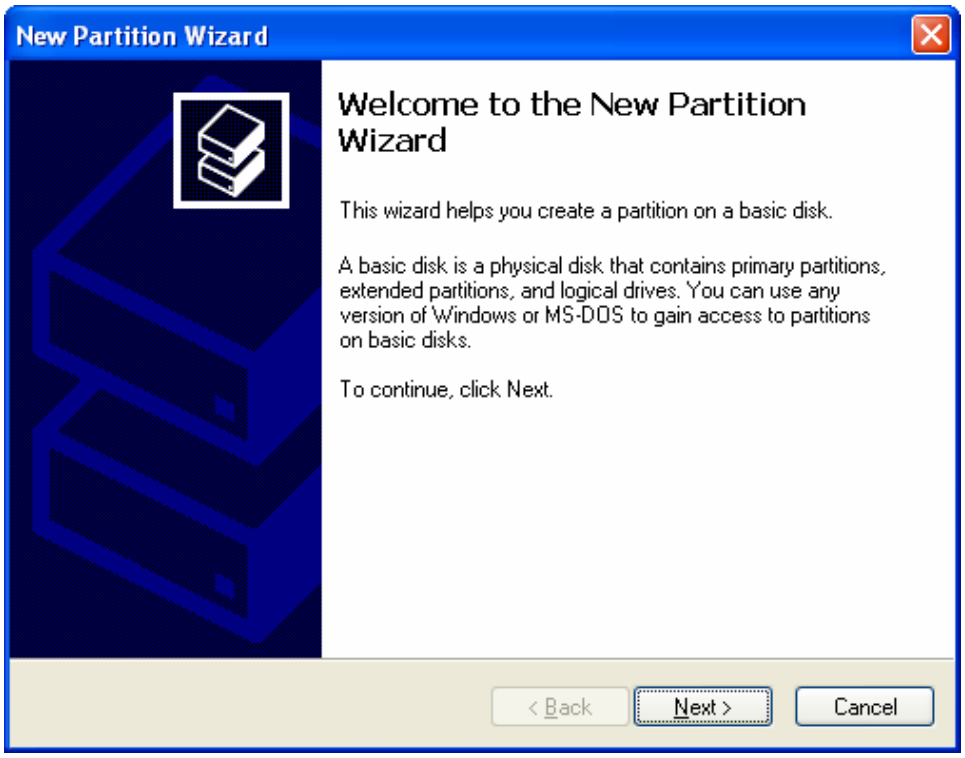
Note: *The disk numbers in the Windows Disk Manager may be different from the Volume numbers shown in the SteelVine Manager Status Window, Basic Configuration Wizard, or Advanced Configuration Wizard. Be sure that you select the correct disk based on the expected disk capacity to create a partition.*

---

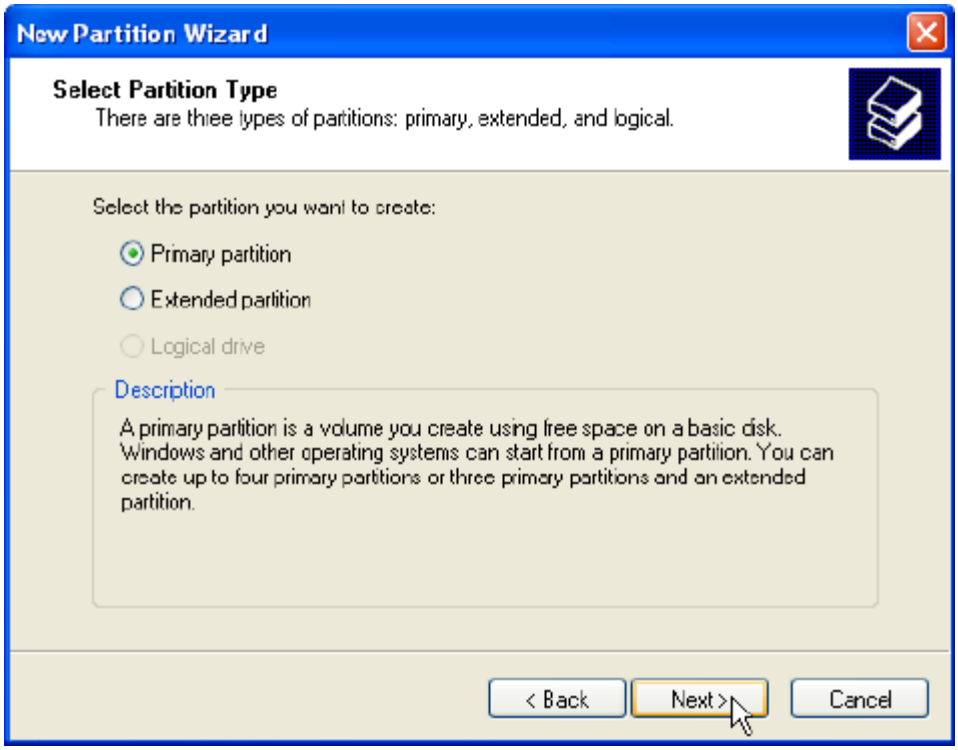
3. Right-click the configured disk's unallocated space and select **New Partition**. If the New Partition option is not available, select the disk and initialize it first. To do this, right-click on the disk item and select "Initialize Disk".



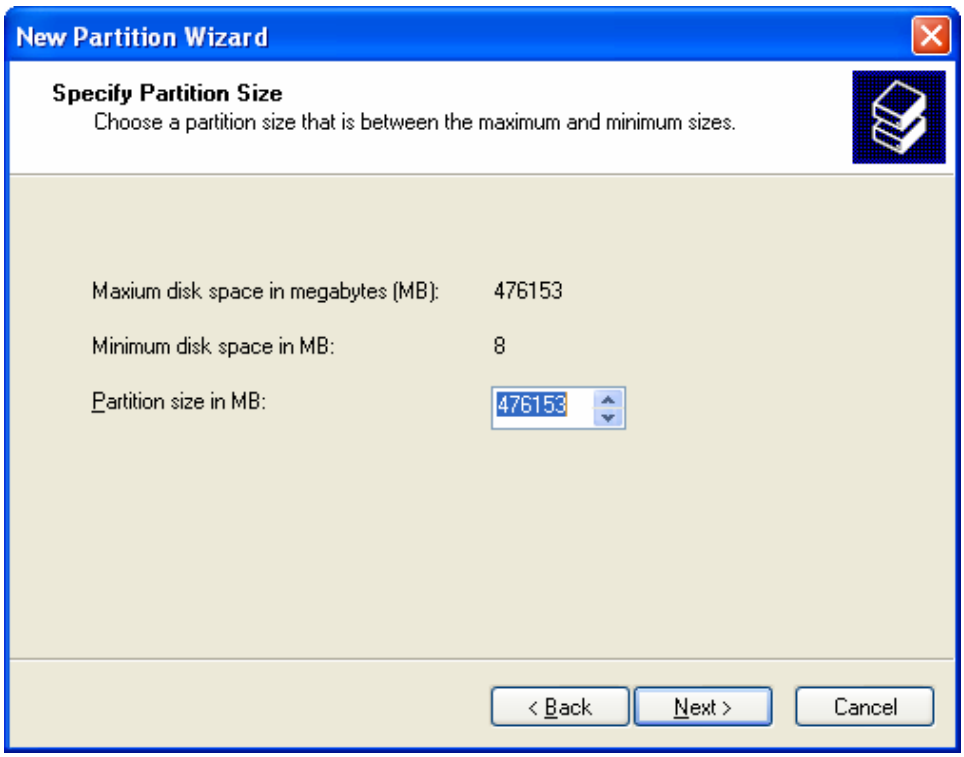
4. Click **Next** to start the Partition Wizard.


New Partition Wizard
Welcome to the New Partition Wizard
This wizard helps you create a partition on a basic disk.
A basic disk is a physical disk that contains primary partitions, extended partitions, and logical drives. You can use any version of Windows or MS-DOS to gain access to partitions on basic disks.
To continue, click Next.
< Back
Next >
Cancel

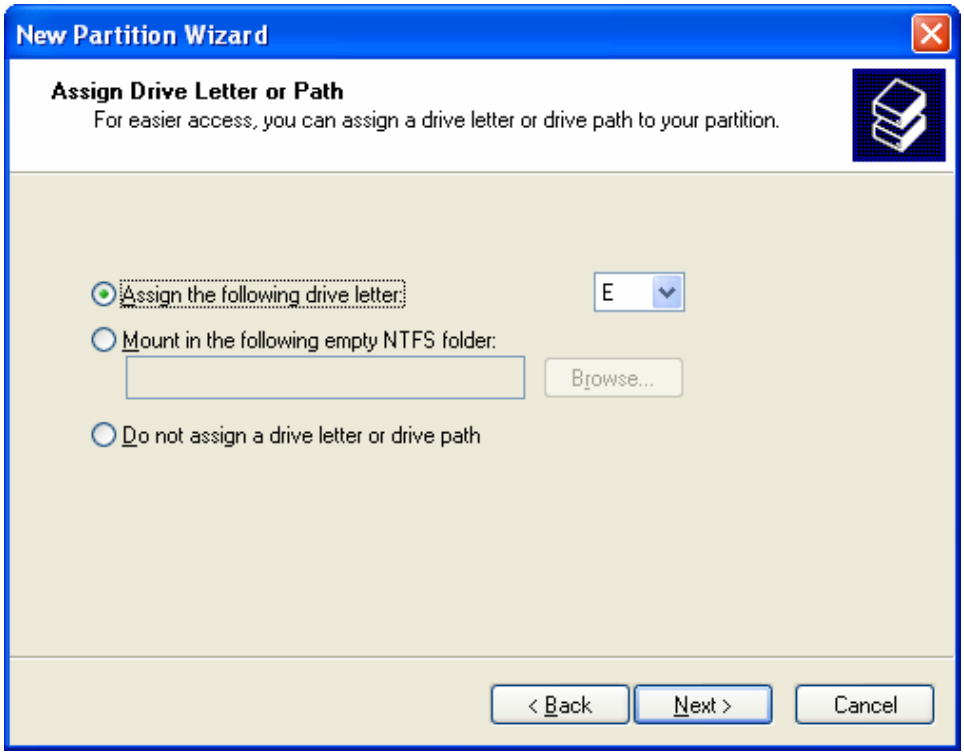
5. Select the Primary or Extended option and click **Next**.


New Partition Wizard
Select Partition Type
There are three types of partitions: primary, extended, and logical.
Select the partition you want to create:
Primary partition
Extended partition
Logical drive
Description
A primary partition is a volume you create using free space on a basic disk. Windows and other operating systems can start from a primary partition. You can create up to four primary partitions or three primary partitions and an extended partition.
< Back
Next >
Cancel

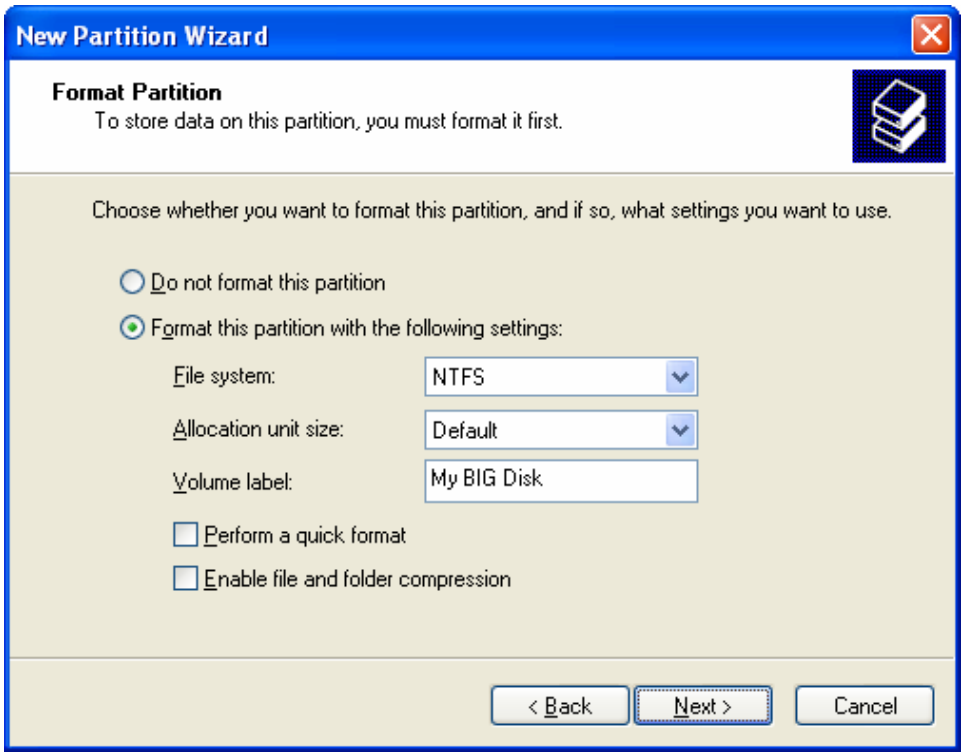
6. Specify the partition size. By default, the partition occupies the entire volume. Click **Next**.


New Partition Wizard
Specify Partition Size
Choose a partition size that is between the maximum and minimum sizes.
Maxium disk space in megabytes (MB): 476153
Minimum disk space in MB: 8
Partition size in MB: 476153
< Back
Next >
Cancel

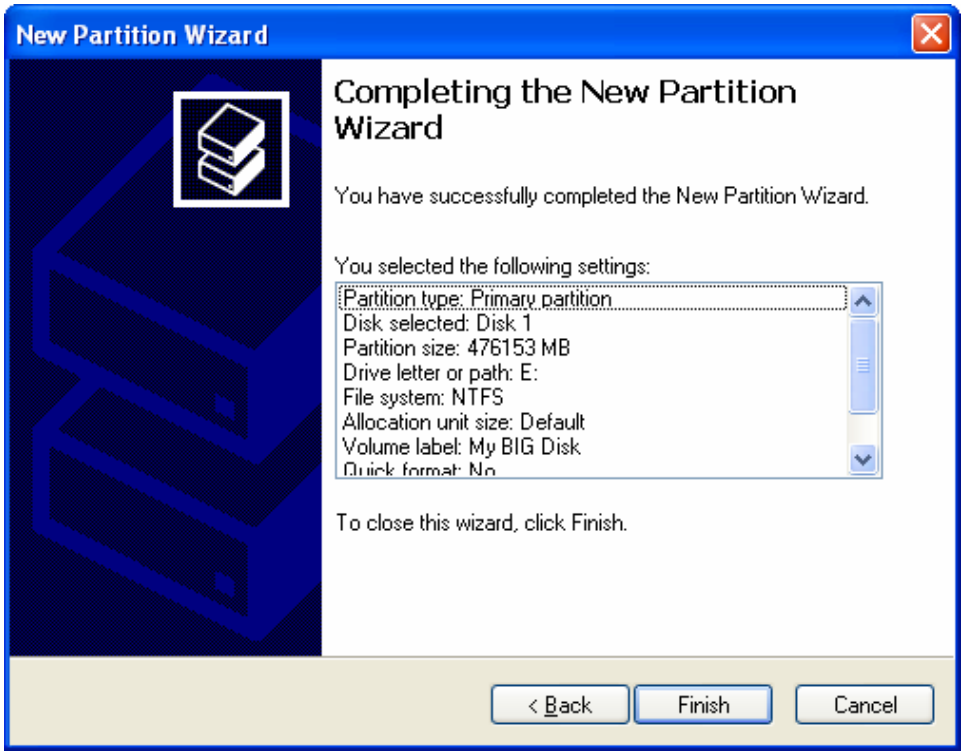
7. Assign a drive letter or mount path and click **Next**.


New Partition Wizard
Assign Drive Letter or Path
For easier access, you can assign a drive letter or drive path to your partition.
Assign the following drive letter:
E
Mount in the following empty NTFS folder:
Browse...
Do not assign a drive letter or drive path
< Back
Next >
Cancel

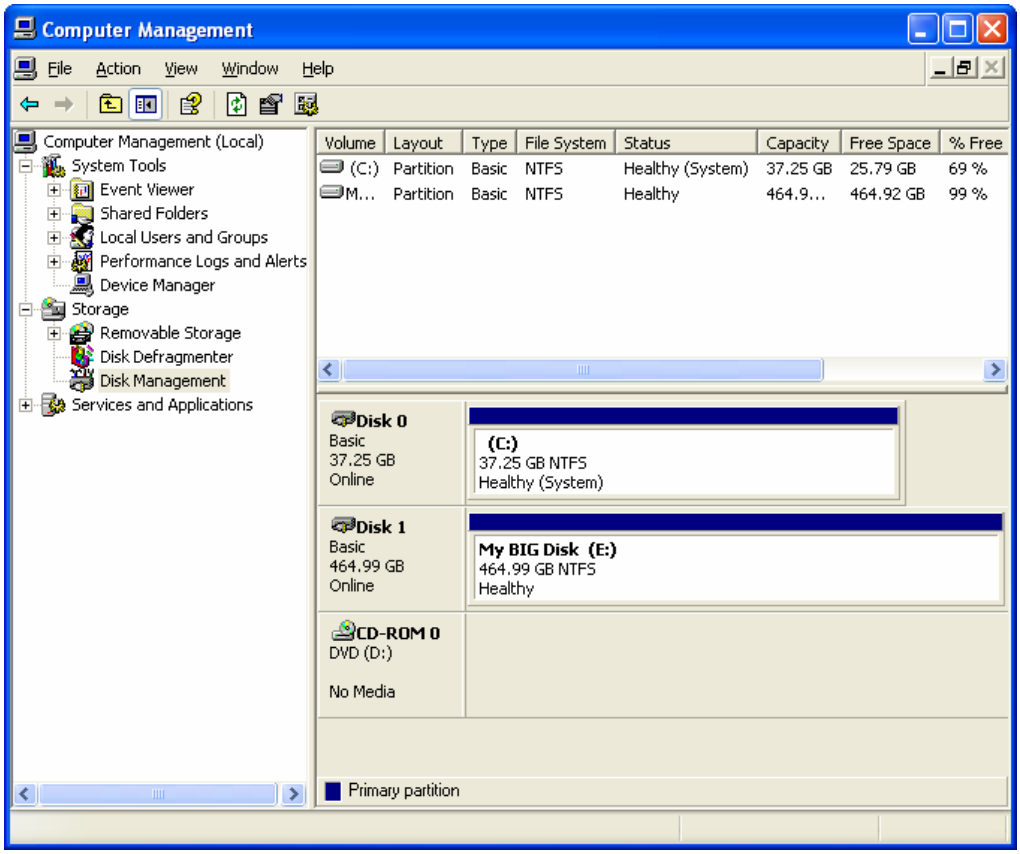
8. Name and format the partition and click **Next**.


New Partition Wizard
Format Partition
To store data on this partition, you must format it first.
Choose whether you want to format this partition, and if so, what settings you want to use.
Do not format this partition
Format this partition with the following settings:
File system:
NTFS
Allocation unit size:
Default
Volume label:
My BIG Disk
Perform a quick format
Enable file and folder compression
< Back
Next >
Cancel

9. Review the file system settings and click **Finish** to create the logical partition.



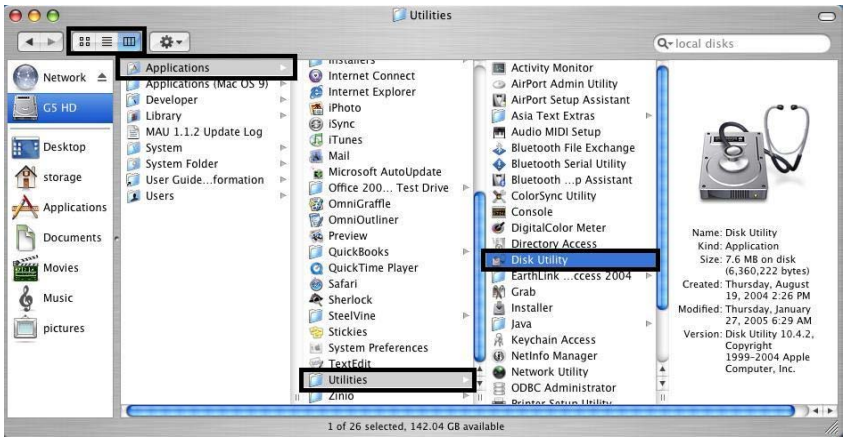
10. Repeat steps 1 through 9 to partition any remaining disks you configured in the SteelVine Manager GUI.



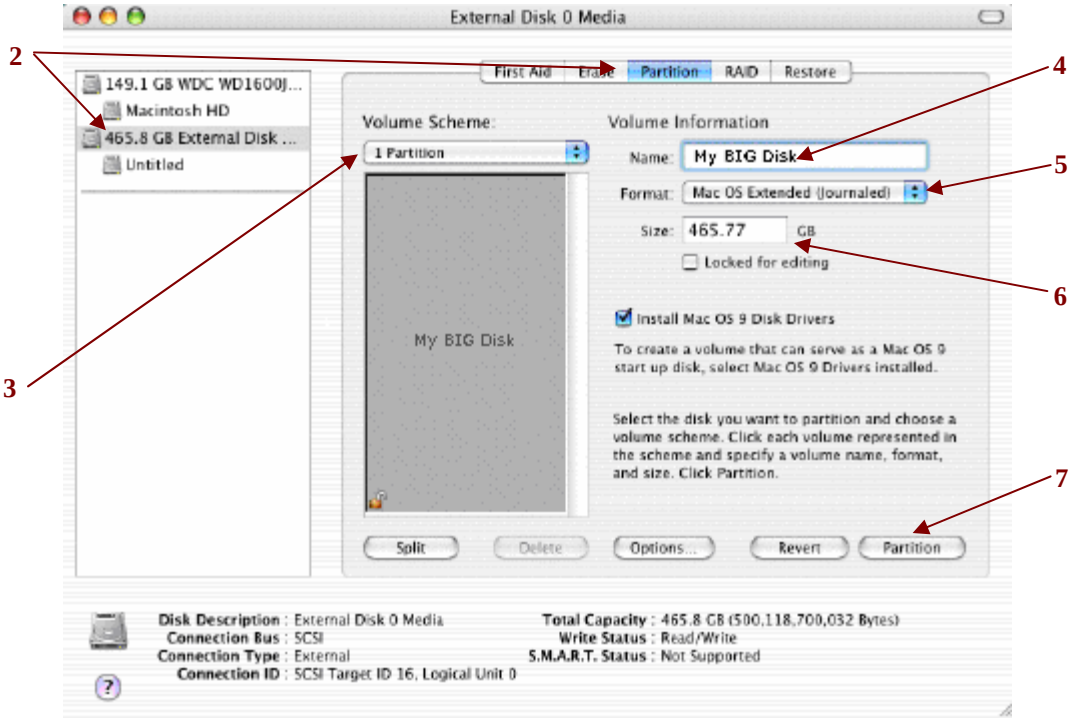
Mac OS X

Important: Before reconfiguring a volume, back up your data and drag the old drive to the trash to un-mount previously defined SteelVine Storage Reference Design partition. If no hard drives are connected to the Storage Appliance, the SteelVine Processor disk (8.0 GB Config Disk Media) will appear. Do not remove or modify that partition. After you configure and partition the new volumes, restore the backed-up data to the new configuration.

1. Launch **Disk Utility** from the **Application > Utilities** folder.

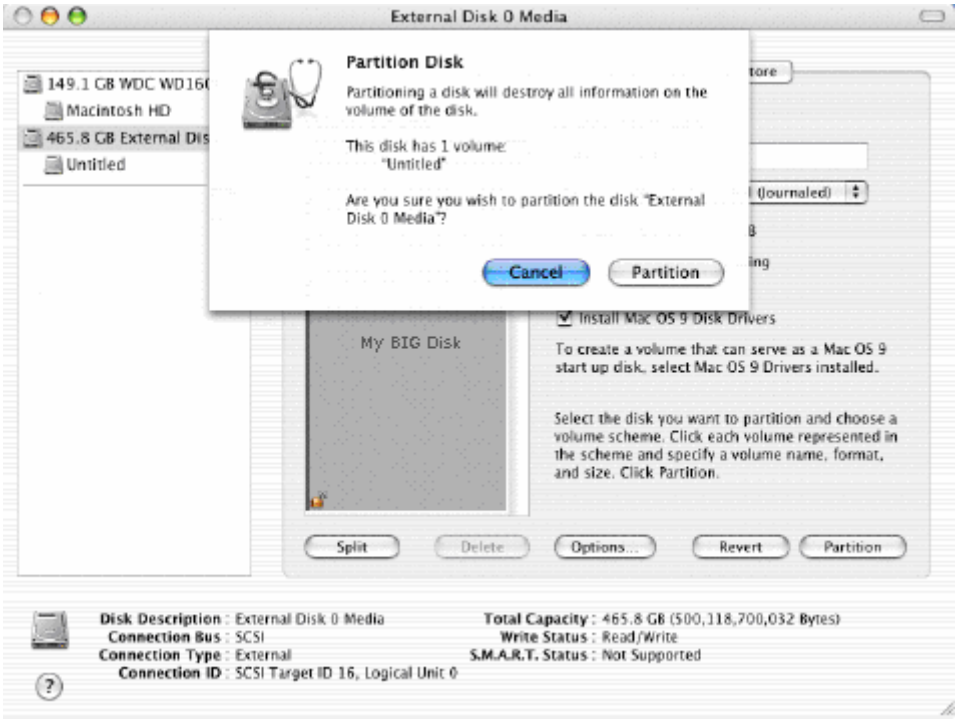


2. Select a configured disk and click the Partition tab. This procedure illustrates the **BIG** Storage Policy configuration, which concatenates the capacity of all hard drives connected to the SteelVine Storage Reference Design.



3. Select **1 Partition** from the **Volume Scheme** drop-down list.
4. Enter a name for the volume in the **Name** field (such as “My BIG disk”.)
5. Select **Mac OS Extended (journaled)** from the **Format** drop-down list.

6. Specify the size of the partition in the **Size** field.
7. Click the **Partition** button**.**
8. Click **Partition** to acknowledge the warning.


External Disk 0 Media
149.1 GB WDC WD160
Macintosh HD
465.8 GB External Dis
Untitled
Partition Disk
Partitioning a disk will destroy all information on the volume of the disk.
This disk has 1 volume:
"Untitled"
Are you sure you wish to partition the disk "External Disk 0 Media"?
Cancel
Partition
My BIG Disk
Install Mac OS 9 Disk Drivers
To create a volume that can serve as a Mac OS 9 start up disk, select Mac OS 9 Drivers installed.
Select the disk you want to partition and choose a volume scheme. Click each volume represented in the scheme and specify a volume name, format, and size. Click Partition.
Split
Delete
Options...
Revert
Partition
Disk Description : External Disk 0 Media
Connection Bus : SCSI
Connection Type : External
Connection ID : SCSI Target ID 16, Logical Unit 0
Total Capacity : 465.8 GB (500,118,700,032 Bytes)
Write Status : Read/Write
S.M.A.R.T. Status : Not Supported

Disk Utility mounts the created partition and represents it with an icon on the desktop. The icon is labeled with the partition name.

9. Repeat steps 1 through 8 to partition any remaining disks you configured in the SteelVine Manager GUI. Remember, do not partition the disk that represents the SteelVine processor.

Linux

Note: *For a more detailed instruction to install the SteelVine Manager, please refer to the Quick Installation Guide for Linux.*

6 View Policy Settings

Overview

The Policy Settings dialog allows you to view the current settings for **Rebuild** and **Verify** operations for SAFE volumes, including:

Init Rebuild: Defines whether to automatically copy (mirror) the contents of Disk 0 to Disk 1 whenever a new SAFE volume configuration is created. When this policy is "**Enabled**", the data from Disk 0 will be automatically copied (mirrored) to Disk 1. When this policy is "**Disabled**", no automatic copy is performed.

Auto Rebuild: Defines whether to remember the non-usable state of a hard drive if it is disconnected and then re-connected to the SteelVine Storage Processor. When this policy is "**Enabled**", the system will always attempt to rebuild a disk that has been inserted, even if that disk had previously been identified as non-usable. When this policy is "**Disabled**", the system will not rebuild a disk that had previously been identified as non-usable.

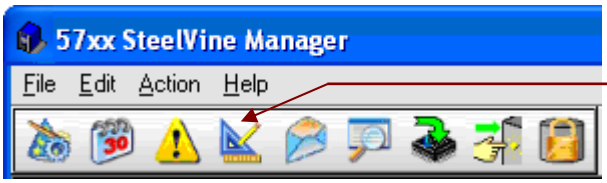
Verify Rebuild: Defines whether to automatically perform a verification of the data after a rebuild operation is completed. When this policy is set to "**Enabled**", a verification of the copied data is automatically performed. When this policy is "**Disabled**", an automatic verification of the copied data is not performed, and any verification would need to be launched manually through the SteelVine Manager GUI.

These settings are based on the hard-strapping of GPI pins 5, 6 and 8 and cannot be modified through the SteelVine Manager GUI.

Accessing the Policy Settings Dialog

Use the following procedure to open the Policy Settings Dialog.

1. Click on the Policy Settings icon along the top of the SteelVine Manager Status window.



Note: *This selection is only available when at least one SAFE volume exists.*

2. When prompted, enter the administrator password. The default password is **admin**.

3. The **Policy Settings** dialog shown below will appear.

Policy Specification for 57xx SteelVine Manager System
57xx SteelVine Manager Policy Specifications
Init Rebuild:
Do NOT Copy the Contents of one disk to the other on creation
Auto Rebuild:
Do NOT Auto Rebuild
Verify:
Verify the Rebuild
Silicon Image
Close

For more information about how manually rebuild and verify a SAFE volume, refer to **Chapter 7, Rebuild & Schedule Disk Verify.**

7 Rebuild & Schedule Drive Verify

This chapter describes the procedures for the following procedures:

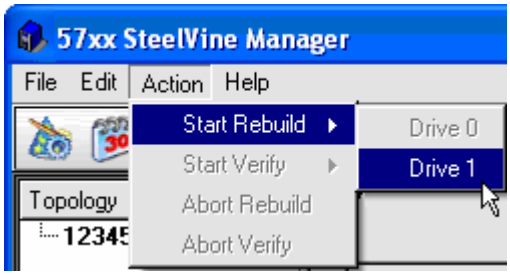
- Manually start or abort a Rebuild operation
- Manually start or abort a Verify operation
- Schedule or modify an automatic Rebuild operation

Note: *This set of features is only enabled when at least one SAFE volume exists.*

Start Rebuild

If the hard drive should fail in any way, the SteelVine Manager is set up by default to automatically begin the rebuild process. Once the Rebuild and Verify operation has been completed, the disk will be available for optimal use.

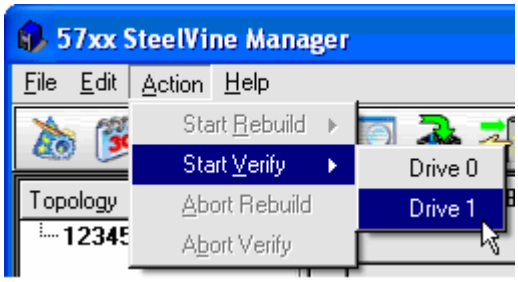
When a SAFE volume exists (including the SAFE component of a SAFE33 or a SAFE50 Storage Policy), you can request a drive rebuild if the disk was marked bad or a previous rebuild operation was aborted. To start the rebuild, select **Action → Start Rebuild → Select Drive n**. Once a rebuild process has been started, it can also be aborted.



Once the rebuild has taken place, the **Verify** process will begin automatically if your system is configured to do so. If the rebuild process is ever interrupted, the rebuild process will resume from the last 10 GB segment that was completed before the interruption occurred.

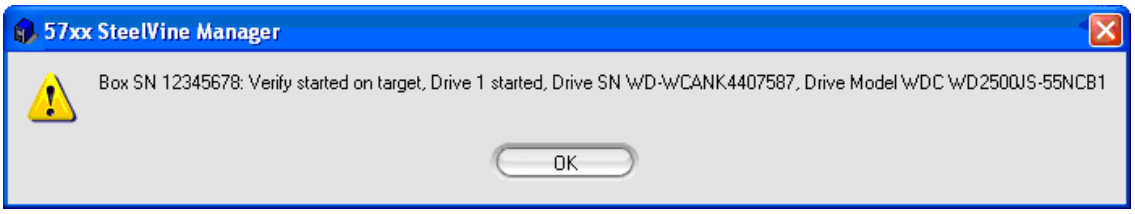
Verify Rebuild

To confirm that the two hard disks that comprise a SAFE volume are exact copies, you can also execute a Verify Disk task manually.



When the SteelVine Storage Reference Design is powered on and you select "**Start Verify**", there is a 60 second delay. The "**Start Verify**" selection will be disabled during this time. Otherwise, if the drive is in normal or verify abort mode, you can manually start the verify operation.

A pop-up will inform you of the action taking place.


57xx SteelVine Manager
Box SN 12345678: Verify started on target, Drive 1 started, Drive SN WD-WCANK4407587, Drive Model WDC WD2500JS-55NCB1
OK

Abort Rebuild

To abort a rebuild process that is already active, select **Action → Abort Rebuild**. The rebuild process will be terminated, and the SAFE volume will remain in a degraded (vulnerable) state until the rebuild is restarted and allowed to complete.

Abort Verify

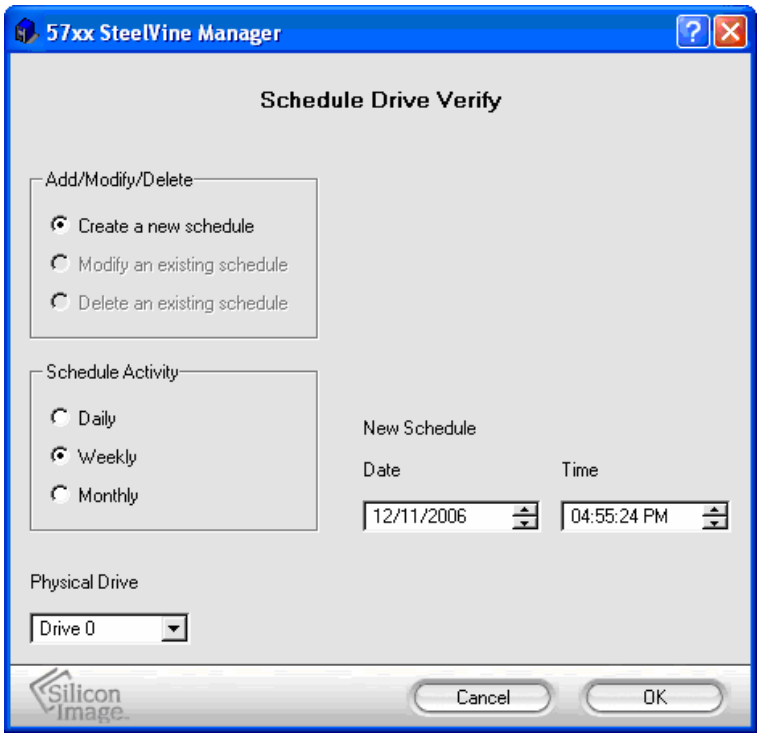
To abort a verify process, select **Action → Abort Verify**. The verify process will be terminated. This selection is only available when a verify process is active.

Schedule Drive Verify

Create a New Schedule

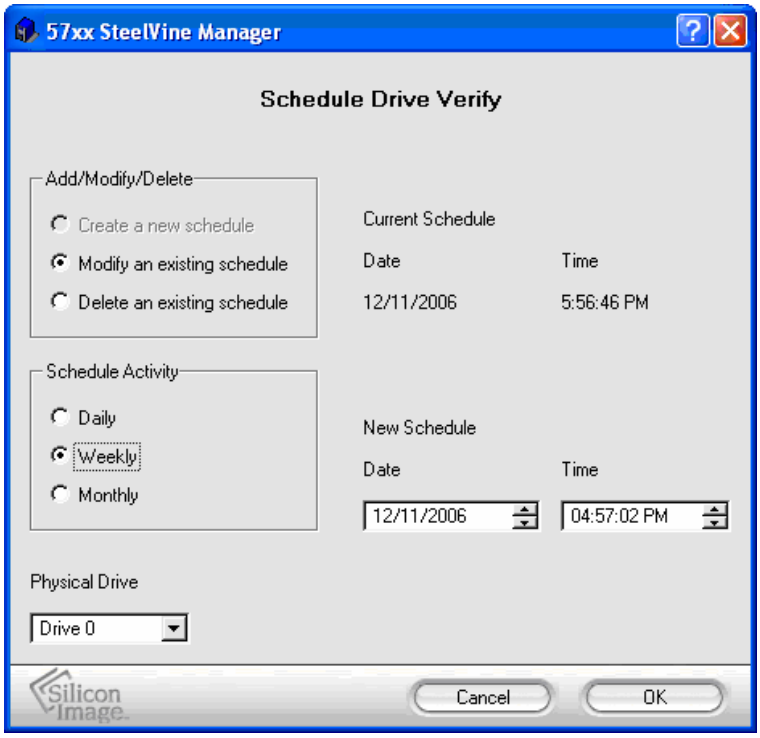
The SteelVine Manager software is set up to automatically verify the rebuild of a hard disk drive. However, you can also create a verification schedule at your discretion.

The schedule can be set for daily, weekly, or monthly. The default setting is weekly. It can be customized to run during the off-hours so as to not interfere with your normal back-up routine. A schedule can be run for each individual hard drive.



Modify/Delete Verification Schedule

You can modify or delete an existing schedule by selecting the desired radio button, then changing the parameters and clicking the **OK** button.



8 Email Notification

Overview

The Email Notification feature allows you to have the SteelVine Manager automatically send an email message if any of the following conditions or situations occur:

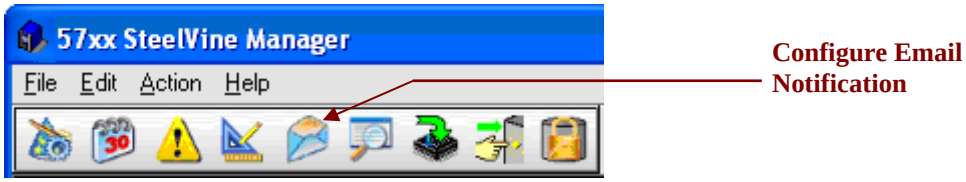
- Partition Rebuild Start
- Partition Verify Start
- Partition Rebuild Resume
- System Fan Too Slow
- No Boxes Found
- Drive Unplugged
- Partition Rebuild Complete
- Partition Verify Complete
- Temperature Too High
- Power supply Fan Too Slow
- Box Removed
- Drive Inserted

Each of the above conditions can be customized for sending options as well as the message that is sent.

Accessing the Email Notification Dialog

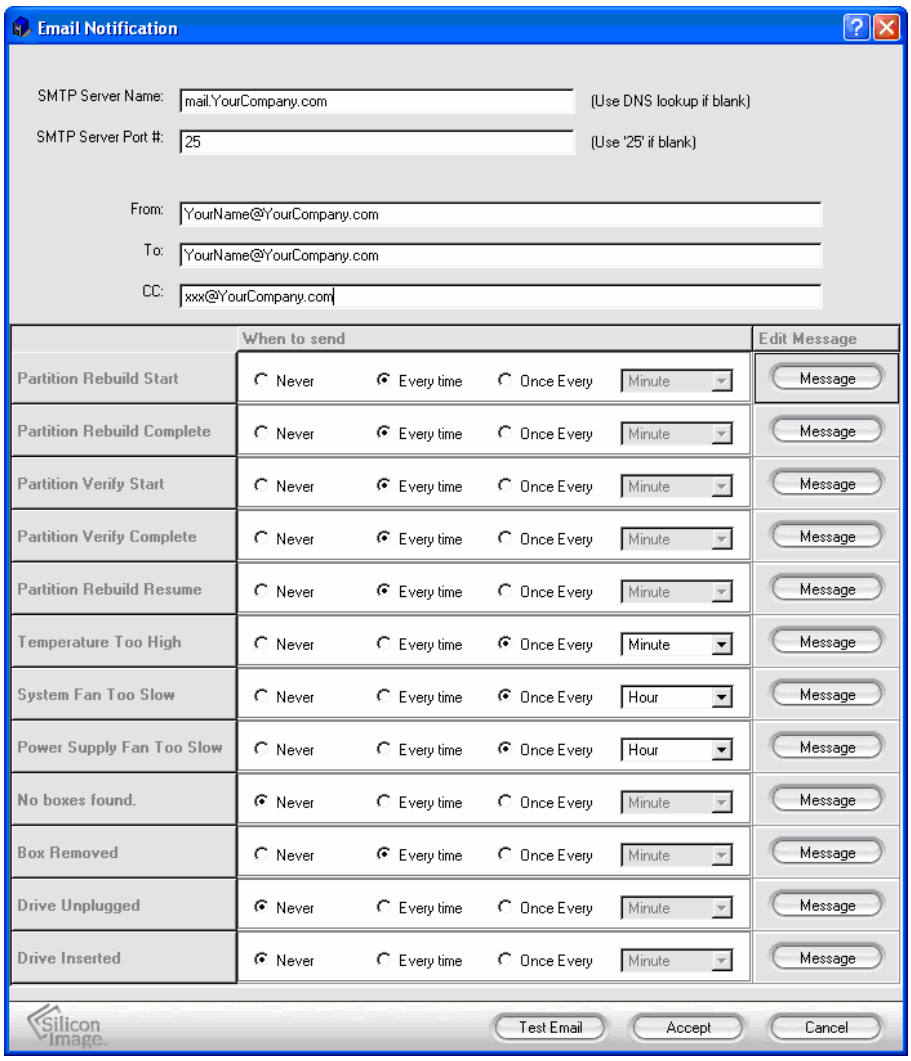
Use the following procedure to enable the security feature and lock all of the hard drives.

1. Click on the **Configure Email Notification** icon along the top of the SteelVine Manager Status Window or select the Setup Email Notification item from the Edit menu pull-down list.



2. Enter the Administrative password for your system (the default password is **admin**).

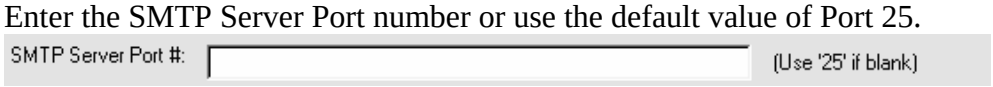
3. The **Email Notification** setup screen show below will appear.



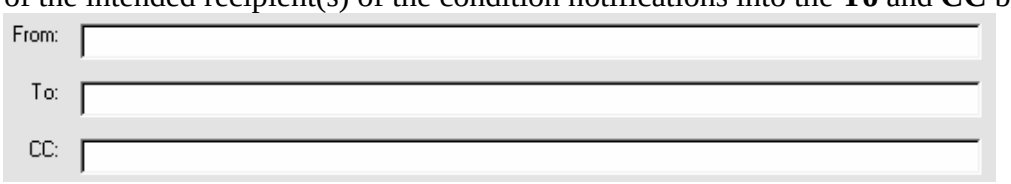
Setting-up Email Notification

1. Enter the hostname or IP address of the SMTP server. If you leave this blank, the SteelVine Manager will perform a DNS lookup and will attempt to find the address of the SMTP server automatically.

2. Enter the SMTP Server Port number or use the default value of Port 25.

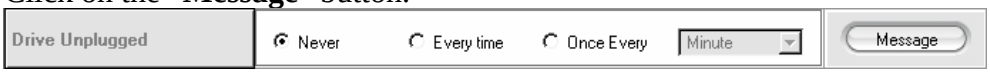


3. Enter your full email address into the From box, and enter the full email address(es) of the intended recipient(s) of the condition notifications into the **To** and **CC** boxes.

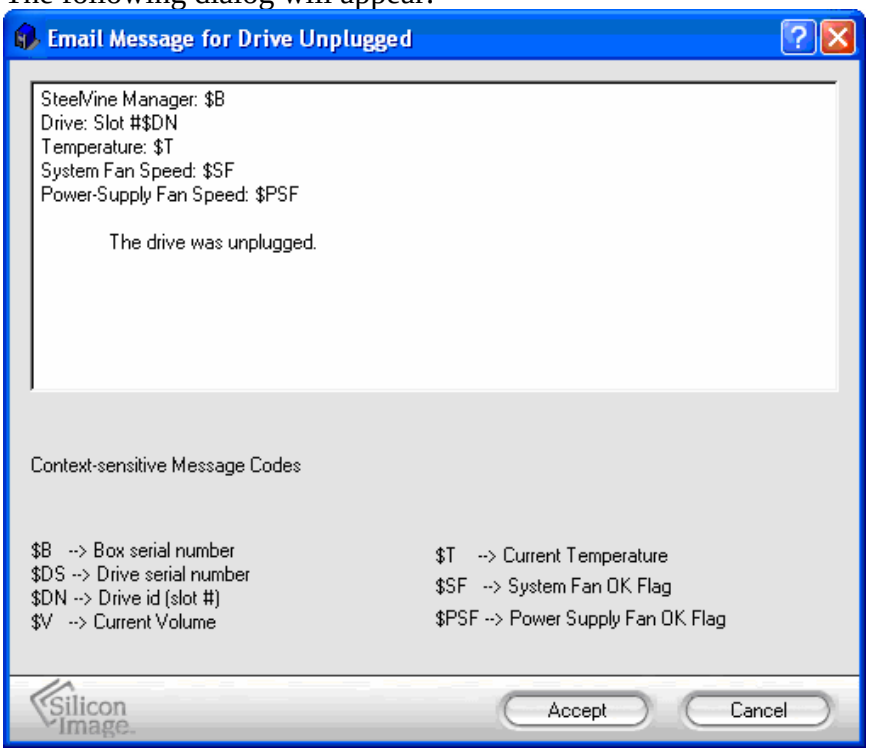


4. Click on the "**Test Email**" button at the bottom of the screen to verify that you have correctly set-up the email portions of this feature. You may need some assistance from your network administrators if you have any problems.
5. For each error condition or event item, you can use the "**When to send**" radio button items to specify the frequency of sending an e-mail notification message to prevent a flood of email messages, especially when the same error condition or event occurs multiple times.
6. The Email Notification feature also you to customize a message for each of the error condition or event items (of which each has its own default message already built in). For example, use the following procedure to edit the message for "Drive Unplugged".

- Click on the "**Message**" button.



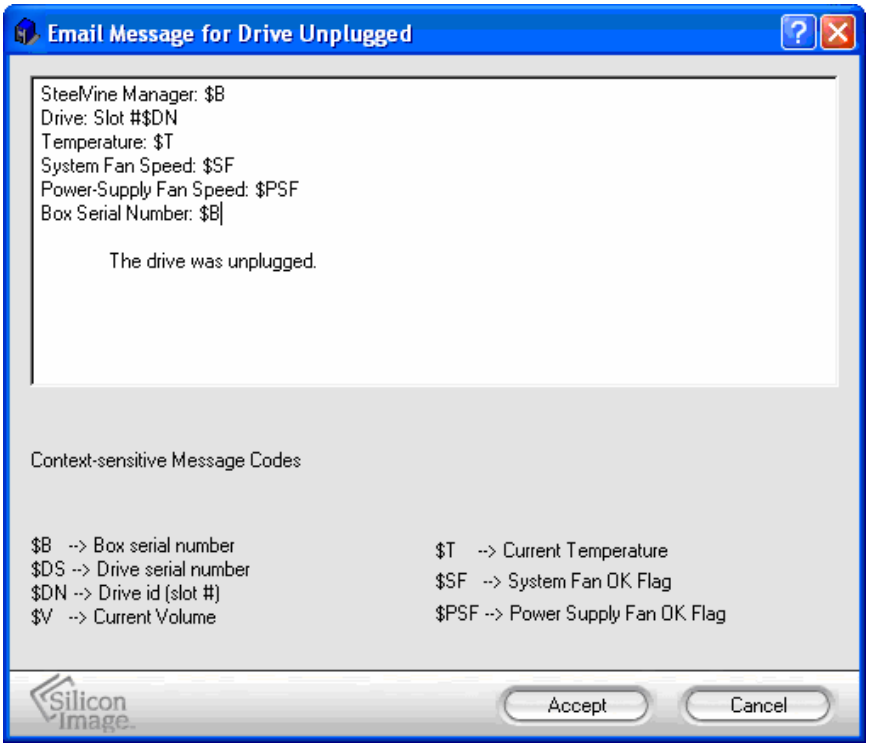
- The following dialog will appear:



- The message information can be customized to suit your needs. The Daemon can extract the following data from the SteelVine hardware:

$B →	Box serial number	$T →	Current Temperature
$DS →	Drive serial number	$SF →	System Fan OK Flag
$DN →	Drive id [slot #]	$PSF →	Power Supply fan OK Flag
$V →	Current volume		

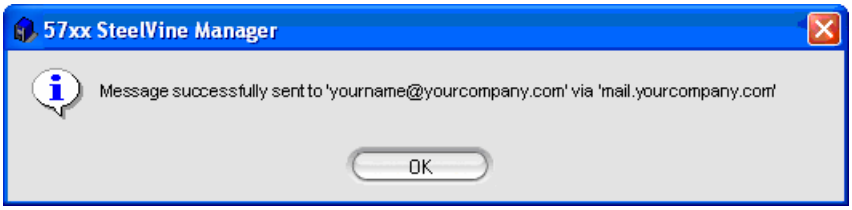
- If there is information that you would like included in the error message, you can enter it by typing in a selected message code listed above. For example, to include the "**Box Serial Number**", type in the descriptive text followed by the message code as demonstrated below.



- Click on the "**Accept**" button to complete the change.

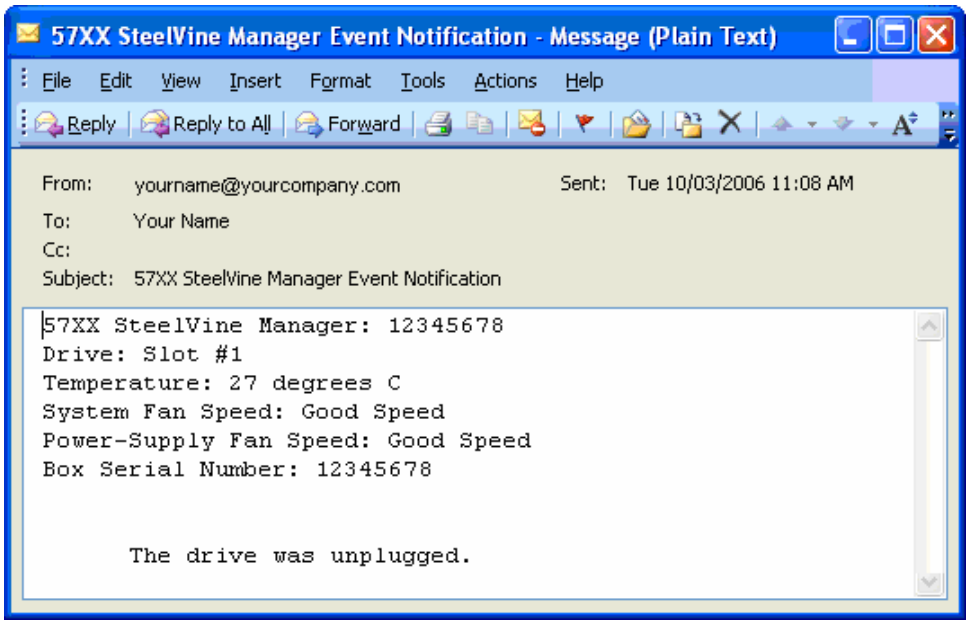
Receiving an Email Notification

When one of the conditions/situations occurs, a pop-up dialog appears on the host computer stating that an email message has been sent.



Note: *You must click 'OK' to remove the pop-up from the screen.*

The email message received from the SteelVine Manager will appear similar to the illustration shown below:


57XX SteelVine Manager Event Notification - Message (Plain Text)
File Edit View Insert Format Tools Actions Help
Reply Reply to All Forward
From: yourname@yourcompany.com
Sent: Tue 10/03/2006 11:08 AM
To: Your Name
Cc:
Subject: 57XX SteelVine Manager Event Notification
57XX SteelVine Manager: 12345678
Drive: Slot #1
Temperature: 27 degrees C
System Fan Speed: Good Speed
Power-Supply Fan Speed: Good Speed
Box Serial Number: 12345678
The drive was unplugged.

Note: *The actual appearance of this message will vary depending on the type of e-mail client software that you are using on your computer system.*

9 Pop-Up Error Notification

Overview

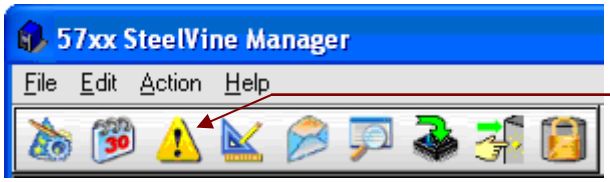
You can enable or disable the Error Popup Notification. The default setting is that this feature is enabled and set to display for 30 seconds. Popup messages can appear for up to 60 seconds.

To set the option for manual closure of the pop-up window, set the seconds to "0". This will keep the pop-up window from closing until you click **OK** to dismiss the pop-up message.

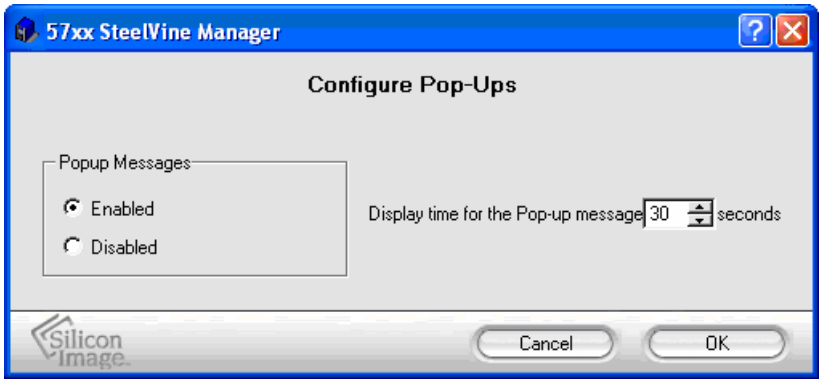
Accessing the Pop-Up Error Notification Dialog

Use the following procedure to enable the security feature and lock all of the hard drives.

1. Click on the **Pop-Up Error Notification** icon along the top of the SteelVine Manager Status Window or select the **Configure Pop-Ups** item from the Edit menu pull-down list.



2. Enter the Administrative password for your system (the default password is **admin**).
3. The **Pop-Up Error Notification** setup screen show below will appear. You can Enable or Disable the popup message by selecting the appropriate radio button. You can also specify the duration of the display time for the popup messages.



4. Click "**OK**" to save your settings.

10 Drive Locking

Overview (not implemented yet)

The Drive Locking feature allows you to protect the contents of all of the hard drives that are connected to your SteelVine Storage Reference Design. By entering a password that you define, you can prevent any unauthorized users from accessing your data. The Drive Locking features uses industry-standard ATA Security commands that are supported by most hard disk drive manufacturers, so you should be able to use this feature with most commercially available drives. If any of your hard disk drives do not support those industry-standard ATA security commands, the Drive Locking feature cannot be used, and your drives will remain unlocked.

The hard disk drive security is initially disabled, so all of your hard disk drives are unlocked until you enter a password to enable security and lock the drives. When you enter your password to enable this security feature, all of the hard drives that are attached to your SteelVine Storage Reference Design become locked, including any hard drives that are connected to subordinate nodes within a cascaded configuration. Once the hard drives are locked, all of the data stored on those hard drives will become inaccessible until you re-enter the same password to unlock the drives. To unlock the hard drives, you must enter the same password that was used to lock them, and all data will be accessible while the drives are powered-on. If you unplug the hard drives or power-off your SteelVine Storage Reference Design, all of the hard drives will revert to a locked state. If you ever forget the password that was used to lock the hard drives, there is no way to recover your data. In that case, the only way to continue using the hard drives is to erase all of the data that was stored and protected, using the "**Secure Erase and Unlock Drives**" action. If you no longer wish to use the security feature, you can disable it. Once the security feature has been disabled, you can only re-enable it by entering and re-entering a password, although the drives must be unlocked before you can disable security.

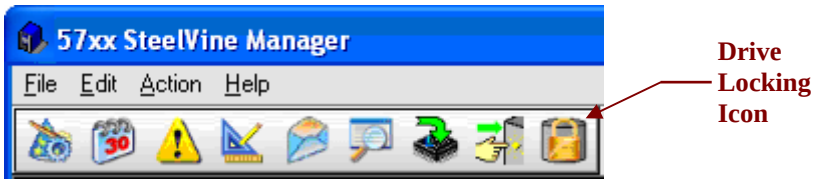
The configuration and management of the Drive Locking feature is performed through the Drive Locking dialog.

Note: *This chapter pertains to the SiI5744, SiI5734 and SiI5723. The SiI5733 performs Automatic drive locking using a random and unique password that is pre-programmed inside the chip, so none of the dialogs described will appear when the SiI5733 is present.*

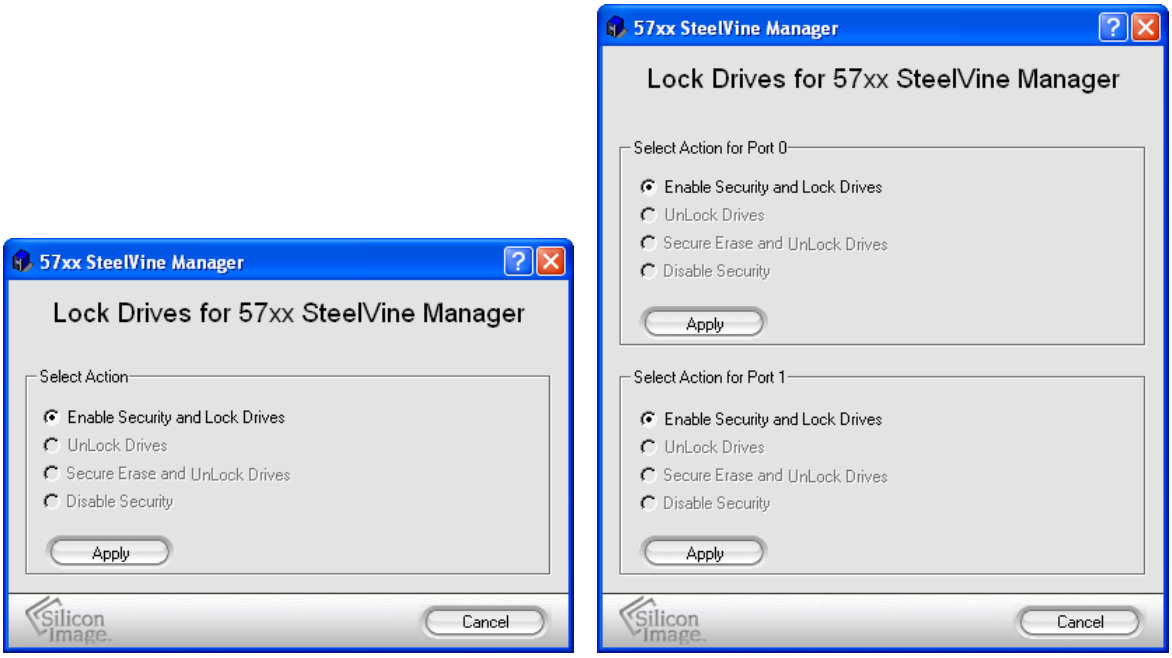
Accessing the Drive Locking Dialog

Use the following procedure to enable the security feature and lock all of the hard drives.

1. Click on the **Drive Locking** icon along the top of the SteelVine Manager Status Window or select the Drive Locking item from the Edit menu pull-down list.



2. Enter the Administrative password for your system (the default password is **admin**).
3. One of the following Drive Locking dialogs will appear, depending on whether you have configured any volumes as JBOD. The various radio buttons and pre-selected items will vary depending on the current Drive Locking state of the hard drive(s).



4. Select the radio button for the operation you wish to perform, and then click the **Apply** button. Refer to the following sections for a description of each operation.

Enable Security and Lock Drives

This option is only available when the security feature is disabled. When you select the "**Enable Security and Lock Drive(s)**" radio button and click on the **Apply** button in the primary Drive Locking screen, the following dialog appears:

Choose and enter any password (up to 32 characters) in the first edit box, and re-enter that same password in the second edit box. For privacy purposes, a series of asterisk (*) characters will appear in place of your password.

You can also use the check-box to indicate whether security can be disabled and then re-enabled with a new password. To preserve the integrity of your original password, this check-box should remain unchecked.

After entering the same password in both edit boxes and checking or clearing the checkbox, click the **OK** button to proceed with enabling security and locking the hard drives. A confirmation dialog will appear indicating that your hard drives have been successfully locked.

Important: *Be sure to record the password that you entered in a safe place, since you will need to re-enter that password to unlock the hard drives and access your data. Once the drives are locked, there is no way to recover your data if you forget your password.*

Unlock Drives

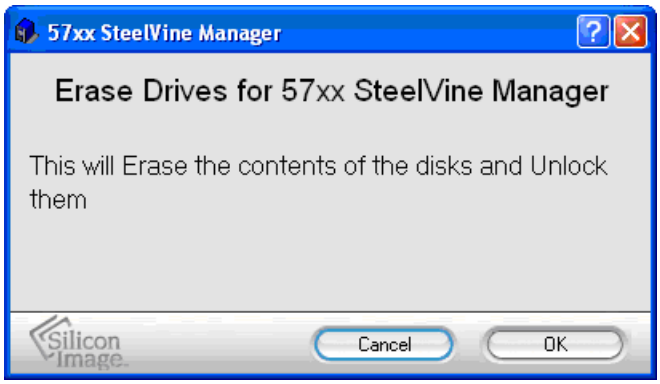
This option is only available when the security feature is enabled and the hard drives have been locked. When you select the "**Unlock Drive(s)**" radio button and click on the **Apply** button in the primary Drive Locking screen, the following dialog appears:

To unlock your hard drives, enter the same password that was entered when you locked the hard drives and click the "**Unlock Drives**" button. You can also use the check-box to indicate whether security can be disabled and then re-enabled with a new password. To preserve the integrity of your original password, this check-box should remain unchecked.

A confirmation dialog will appear indicating that your hard drives have been successfully unlocked.

Secure Erase and Unlock Drives

This option is only available when the security feature is enabled and the hard drives have been locked, and it should only be used when you have forgotten the password that you used to lock the drives. When you select the "**Secure Erase and Unlock Drive(s)**" radio button and click on the **Apply** button in the primary Drive Locking screen, the following dialog appears:


57xx SteelVine Manager
Erase Drives for 57xx SteelVine Manager
This will Erase the contents of the disks and Unlock them
Silicon Image
Cancel
OK

Since this operation will erase any data that had been stored on your hard drives and it cannot be reversed, you must click the "**I understand…**" check-box before the **Apply** button is enabled. To proceed with securely erasing your hard drives, click the Apply button. Another confirmation is required to verify that you really want to proceed with erasing your data.

Note: *This action should only be used as a last resort, when all other attempts to remember your password have failed.*

Disable Security

This option is only available when the security feature is enabled, but the hard drives have been unlocked, and it should only be used when you no longer need to protect your data from access by unauthorized users. When you select the "**Disable Security**" radio button and click on the **Apply** button in the primary Drive Locking screen, the following dialog appears:

57xx SteelVine Manager
Disable Security for 57xx SteelVine Manage
This will allow the data stored on your disks to be accessed without a password
Silicon Image
Cancel
OK

To disable security, click on the "**Disable Security**" button. Another confirmation is required to verify that you really want to disable security.

11 Backup Button

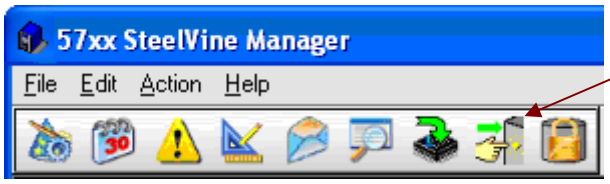
Overview

The Backup Button feature allows you to launch a pre-selected third-party software application by pressing a special-purpose push-button on the SteelVine Storage Reference Design (different from the mode change push-button used to create a new Storage Policy). Direct support is available for the Retrospect Express backup application from EMC Corporation (version 6.5 or later), although you configure this feature to launch any other application program by specifying its command-line syntax.

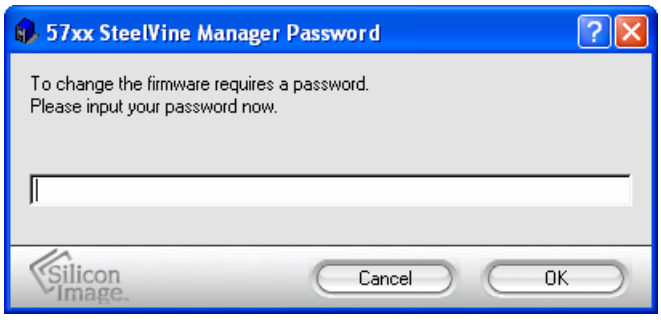
Accessing the Backup Button Dialog

The Backup Button dialog allows you to select the application that should be associated with the Backup Button on the SteelVine Storage Reference Design. Use the following procedure to access the Backup Button dialog.

1. Click on the **Backup Button** icon along the top of the SteelVine Manager Status Window.



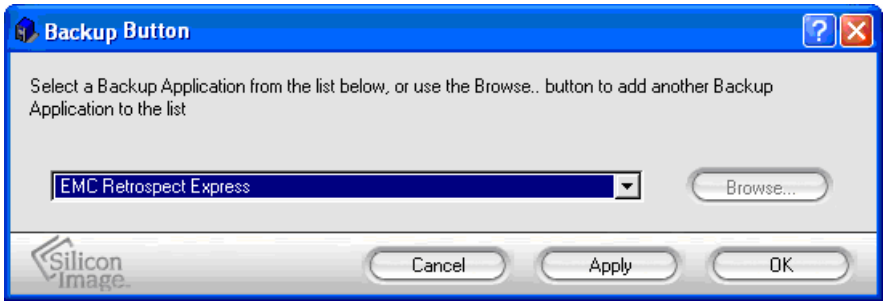
2. When prompted, enter the administrator password. The default password is **admin**.



3. The Backup Button dialog will appear. Refer to the following sections depending on which backup application software you want to use with the Backup Button.

EMC Retrospect Express

If you have already installed the EMC Retrospect Express application on your computer, that backup application package will appear in the drop-down list in the Backup Button dialog. You can then select the EMC Retrospect Express item from that list.


Backup Button
Select a Backup Application from the list below, or use the Browse.. button to add another Backup Application to the list
EMC Retrospect Express
Browse...
Silicon Image
Cancel
Apply
OK

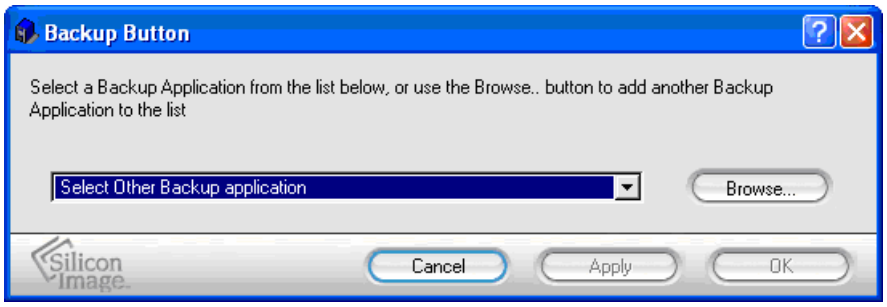
Click on the **Apply** button to apply your selection.

You can then press the "**Backup Button**" push-button on the SteelVine Storage Reference Design platform, which will launch the Retrospect Express application extension that was installed as part of that package. The first time you launch that application extension, you will be prompted to configure the backup job parameters (such as source and destination directories). Thereafter, whenever you press the "**Backup Button**" push-button on the SteelVine Storage Reference Design, the specified backup job will automatically begin.

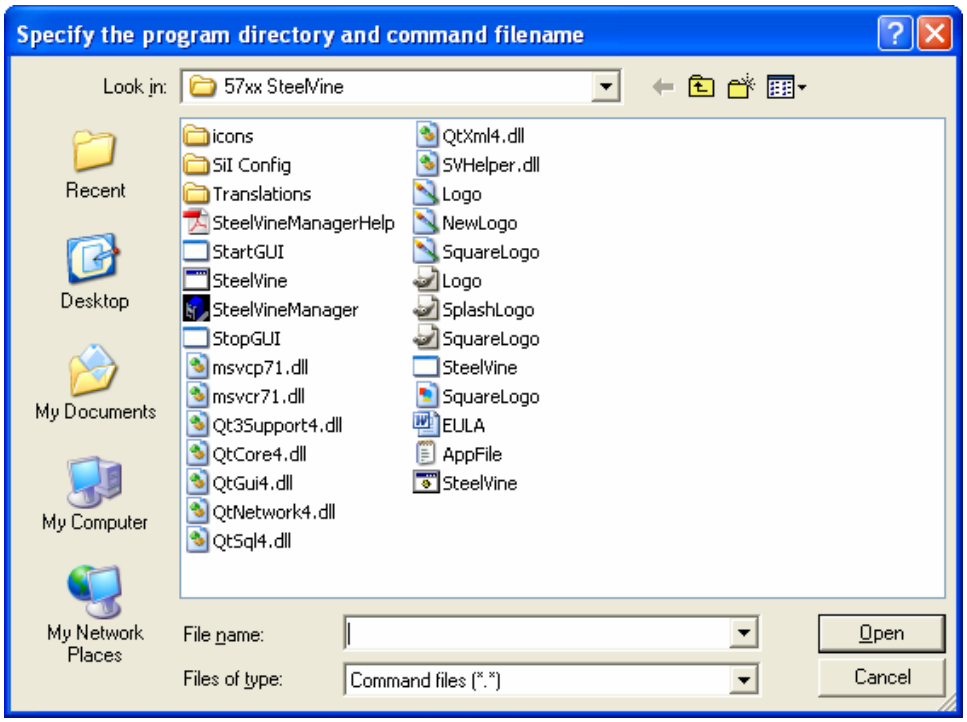
While the backup job is running, the Backup LED on the SteelVine Storage Reference Design will blink, and additional button presses will be ignored until the backup job has completed. When the backup job is completed, the Backup LED will return to its normal state.

Other Third-Party Applications

If you do not have the EMC Retrospect Express application installed on your computer, you can browse for any other application program.


Backup Button
Select a Backup Application from the list below, or use the Browse.. button to add another Backup Application to the list
Select Other Backup application
Browse...
Silicon Image
Cancel
Apply
OK

Select the "**Select Other Backup application**" item from the drop-down list; then use the "**Browse**" button to navigate to the folder that contains the application program. On a Windows system, you can select an executable file (with a filename extension of **.exe**) or you can create a text file (with an extension of **.cmd**) that contains one or more commands consisting of program names and command line parameters, and ends with an "**exit**" command, similar to a DOS batch file (**.bat**).



Click on the application program or command file that you want to associate with the Backup Button, and then click on the "**Open**" button. The full pathname of that application program will be added to the drop-down list in the previous dialog. Click on the "**Apply**" button to save that association. It is possible to add any number of application programs to the drop-down list, although only one application program can be the active selection.

Once the application program has been is selected, you can then press the **Backup Button** push-button on the SteelVine Storage Reference Design platform to launch the application that you specified. When launching a third-party application or command file, the Backup LED on the SteelVine Storage Reference Design platform will not give any indication of the program's status.

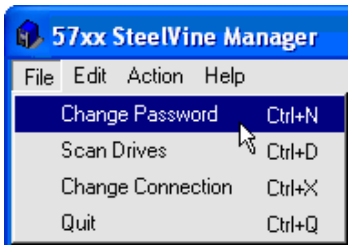
12 Administering the SteelVine Manager

This section explains how to perform administrative functions in the SteelVine Manager.

Changing the Administrative Password

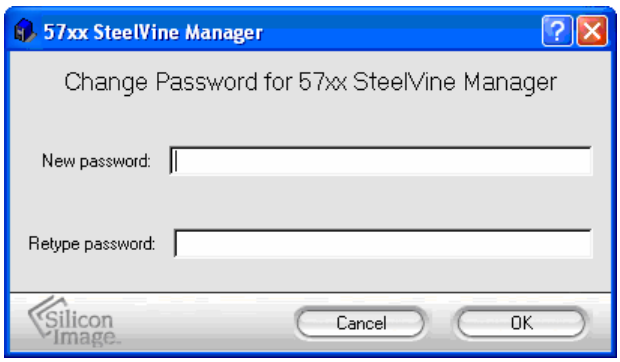
The SteelVine Manager restricts configuration access with a password prompt. The password information is stored locally on the host running the daemon. The default password is **admin**. See to the Manage the Client Connection Daemon section for a description of the daemon.

1. Select **Change Password** from the File menu.



2. Enter the current password (or use **admin** if you have not changed the default password) and click **OK**.

3. Enter a new password of five or more characters in both password fields.



4. Click **OK** to save the new password.

Manage Configuration Files

The Configuration Wizard provides menus and toolbar buttons to manage configuration files.

- The Read Config File command in the File menu imports a configuration file so that the user can restore a previously saved configuration (storage policy). This feature will only be available in the GUI Only mode on the rotary switch.
- The Save to Config File command in the File menu exports the SteelVine Storage Reference Design configuration to a file.

Each of the procedures in the Basic Configuration section prompts you to save a configuration file.

Import (Read) a Configuration File

Note: *You must have previously saved a configuration file so that one is available to import.*

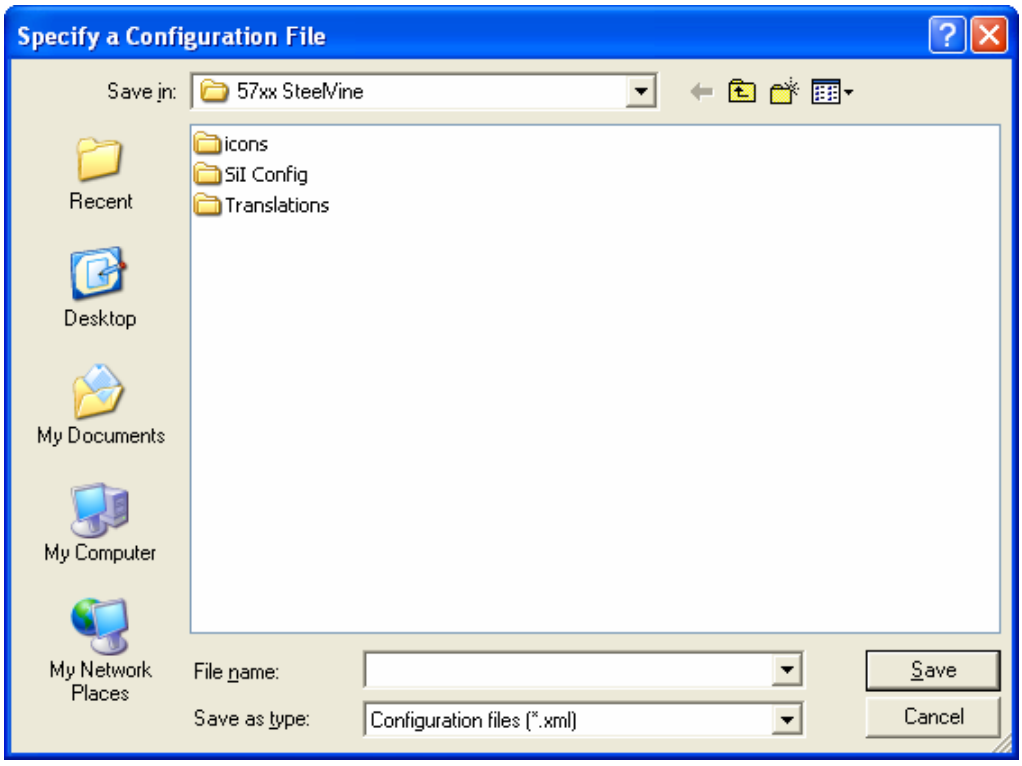
1. Select **Configure Box** from the Edit menu or click the **Configure Box** toolbar button to open the Basic Configuration Wizard.
2. Select **Read Config File** from the File menu

3. Navigate to the required file and click **Open** to import it. The Wizard provides notice of a successful import and graphically displays the imported volumes.
4. Click **Apply** to implement the imported configuration.

Save a Configuration File

1. Select Configure Box from the Edit menu or click the Configure Box toolbar button to open the Basic Configuration Wizard.
2. Select **Save to Config File** from the File menu.

3. Navigate to the appropriate directory, enter a file name in the **File Name** text box, and click **Save**.



Manage the Client Connection to the Daemon

The SteelVine Manager software consists of two modules:

- **Daemon:** a background process that establishes communication with the SteelVine Storage Processors (implemented as a Service on Windows platforms)
- **SteelVine Manager GUI**: an application that provides the graphical user interface

The *daemon* monitors the status of the SteelVine Storage Reference Design. By default, the user interface attaches to a daemon running on the same host to display the information gathered by the daemon. You can configure the user interface to display information tracked by a daemon running on a remote host. Having the user interface remote to the daemon allows remote monitoring for system fan and hard drive failures. Identification of a failed part may then allow the service provider to replace failed components before further complications arise.

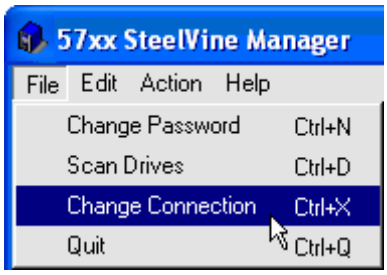
Prerequisites

Ensure you have the following before you establish the remote connection:

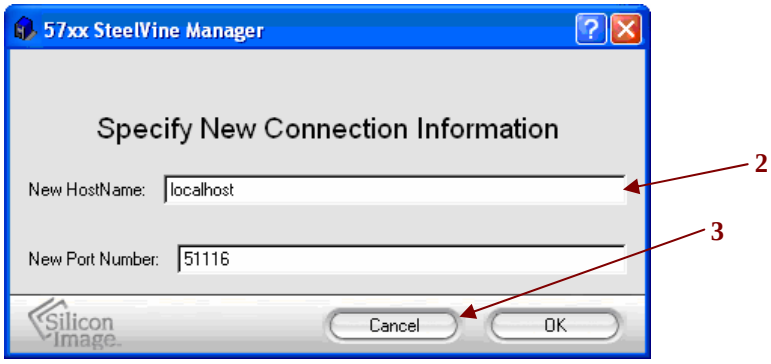
- The daemon software is installed and running on a host computer connected to the SteelVine Storage Reference Design.
- The SteelVine Manager GUI software is installed and running on a remote host computer.
- A TCP/IP connection can be established between the daemon and the user interface. The daemon listens for connections on TCP port 51116. Do not change this port number.

Set Up a Remote Connection

1. In the Status Window, select **Change Connection** from the File menu.



2. Enter the host name or IP address of the host computer on which the daemon is installed and enter the default port number of 51116.
3. Click **OK**.

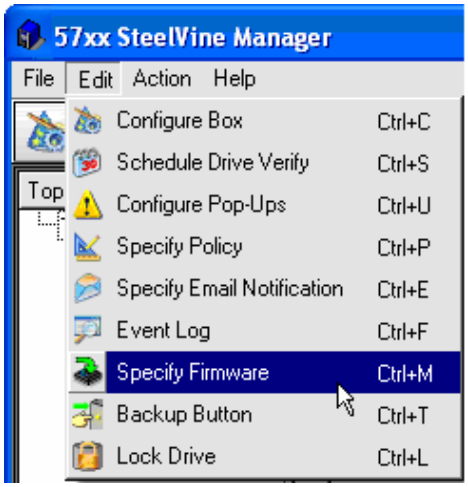


The user interface establishes the requested connection and displays information gathered by the remote daemon in the Status Window.

Note: *The host name or IP address is not saved across sessions.*

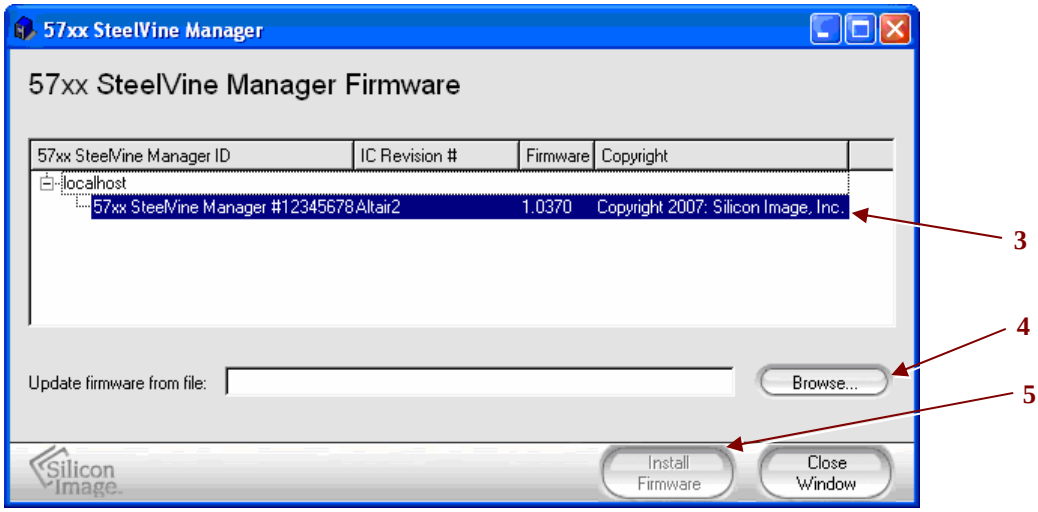
Install New Firmware

1. Select **Specify Firmware** from the Edit menu of the Status Window or click the **Specify Firmware** toolbar button.



2. Enter the current password (or use **admin** if you have not changed the default password) and click **OK**.

The Firmware Selection dialog shows all of the top-level SteelVine Storage Reference Designs that are attached to the host, the integrated circuit (IC) revision, and the current firmware installed on each Storage Appliance.



3. Select the SteelVine Storage Reference Design that requires a firmware upgrade.
4. Click the **Browse** button next to the **Update firmware from file** text box, navigate to the new firmware file you wish to load from a CD or hard disk, and select the desired firmware image file with a **.bin** filename extension.
5. Click **Install Firmware** to begin the upgrade process.

Important: *Do not install a new firmware image while an active Rebuild operation is underway. In addition, do not access or power-off the SteelVine Storage Reference Design while installing the firmware image. The firmware installation process takes less than two minutes to complete.*

---

6. After the firmware download is completed, a confirmation dialog appears directing you to restart your system. If the SteelVine Storage Processor is part of your system motherboard, select the "**Shutdown Now**" option to shutdown your system, so that the new firmware will be used upon startup. Otherwise, if the SteelVine Storage Processor is used in an external enclosure, you should cycle power on that device.

Note: *For the first release, the firmware image will only be downloaded to the top-level node of a cascaded configuration. All nodes within a cascaded configuration must use the same firmware revision, so any subordinate nodes must be manually upgraded separately.*

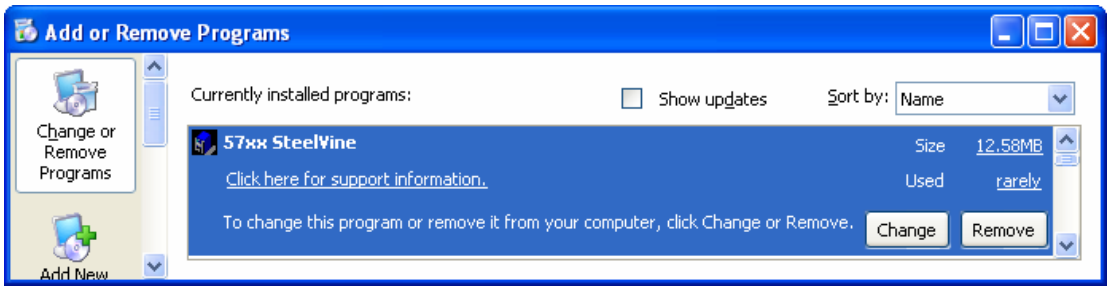
Install New SteelVine Manager Software

Before you install new software, uninstall the current version. The un-installation process stops the daemon so it can be removed along with the user interface. The new version of the daemon starts automatically when you install new software.

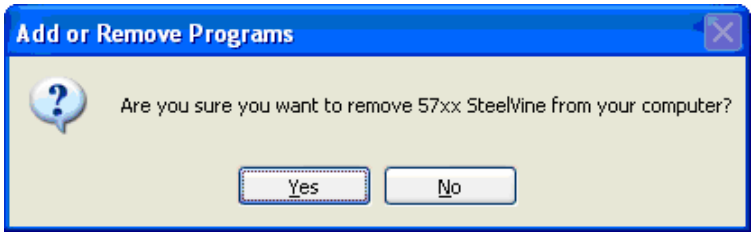
Uninstall Current Software

MS Windows

1. Exit the SteelVine Manager GUI.
2. From the Windows taskbar, select **Start** > **Control Panel** > **Add or Remove Programs**.
3. Select the SteelVine SteelVine Storage Reference Design Manager program and click **Remove**.



4. Confirm that you want to remove the SteelVine Manager software by clicking **Yes**.



5. Optionally move or delete the .xml configuration files that the InstallShield Wizard left in the installation directory (by default, **C:\Program Files\Silicon Image\57xx SteelVine**).

Note: *When updating the software, you must manually delete the database files named* ***SV_SQL3_Config.db*** *and* ***SV_SQL3_Events.db*** *from the* ***C:\WINDOWS\system32*** *directory. Be sure to remove these files BEFORE installing the new software.*

Mac OS X

1. Optionally move saved .xml configuration files from the **Applications > Utilities > SteelVine > SteelVine Manager** folder to another location.
2. Drag the **Applications > Utilities > SteelVine** folder to the trash to remove the GUI modules and supporting files.
3. Drag the **Library** > **StartupItems** > **SteelVineDaemon** folder to the trash to remove the daemon startup scripts.

Install New Software

For Windows, Mac, or Linux, follow the instructions in the *SteelVine Quick Installation Guide* for your operating system to install a new version of the SteelVine Manager software.

13 Customizing the SteelVine Manager

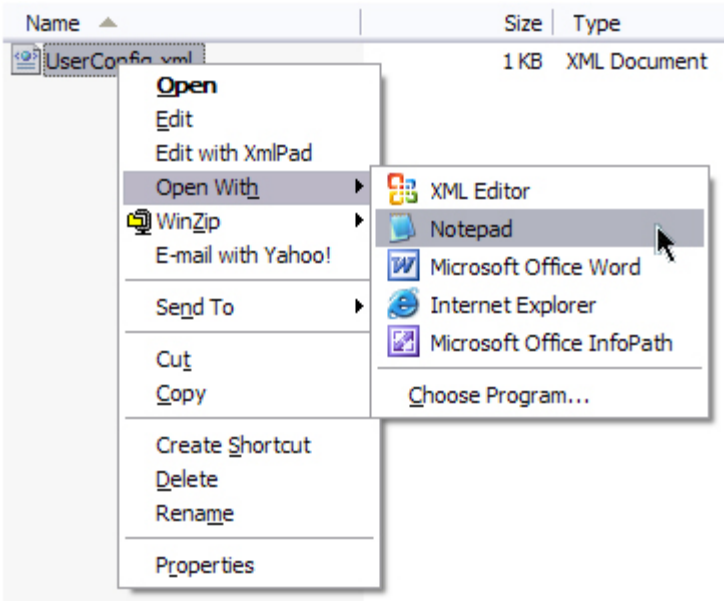
Editing the UserConfig.xml File

The **`UserConfig.xml`** file is used to define the Status Screen Title Bar and allow configuration of the Policy Change as well as the Advanced Configuration features.

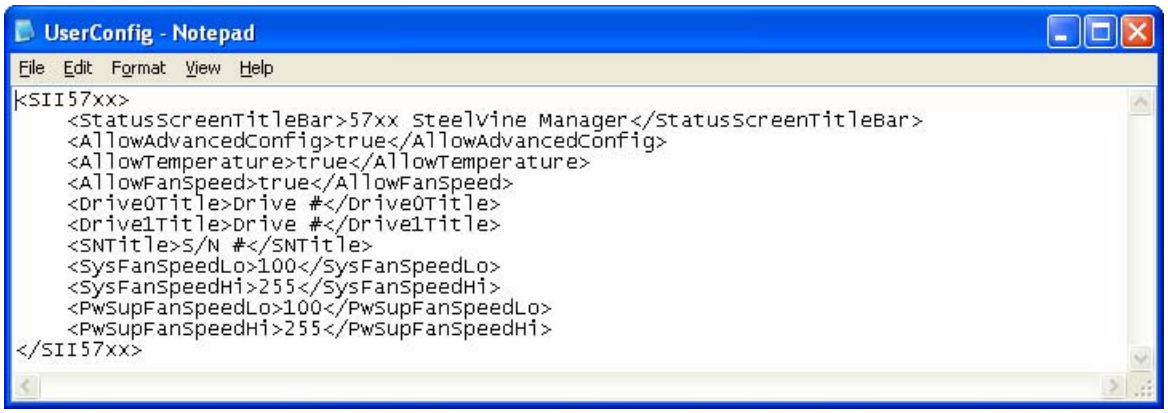
The UserConfig.xml file can be found in the following location:

`C:\Program Files\Silicon Image\57xx SteelVine\SiI Config.`

To edit this file, right-click on the file name, move the mouse to **Open With**, and select Notepad.



When this file is open, you will see the following:



The "**StatusScreenTitleBar**" item is used to change the Product Name that appears at the top of the GUI. To change this field, replace the string that says "**57XX SteelVine Manager**" with your desired product name.

<StatusScreenTitleBar>
57XX SteelVine Manager</StatusScreenTitleBar>

<StatusScreenTitleBar>
Your Company Name</StatusScreenTitleBar>

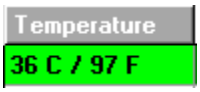
The "**AllowAdvancedConfig**" item is used to enable or disable the Advanced Configuration Wizard (for more information, refer to Chapter 4 Advanced Configuration on page 33.) When the value is set to "**true**", the Advanced Configuration Wizard will be available. When the value is set to "**false**", the Advanced Configuration Wizard will not be available.

<AllowAdvancedConfig>true</AllowAdvancedConfig>

(not displayed)

<AllowAdvancedConfig>false</AllowAdvancedConfig>

The "**AllowTemperature**" item is used to enable or disable the display of the System Temperature field on the SteelVine Manager Status Window. When the value is set to "**true**", the Temperature field will be displayed. When the value is set to "**false**", the Temperature field will not be displayed.



<AllowTemperature>true</AllowTemperature>

(not displayed)

< AllowTemperature>false</AllowTemperature>

The "**AllowFanSpeed**" item is used to enable or disable the display of the Fan Speed field on the SteelVine Manager Status Window. When the value is set to "**true**", the Temperature field will be displayed. When the value is set to "**false**", the Temperature field will not be displayed.

<AllowFanSpeed>true</AllowFanSpeed>

(not displayed)

<AllowFanSpeed>false</ AllowFanSpeed>

The "**Drive0Title**", "**Drive1Title**" and "**SNTitle**" items allow you change the headings for the Drive and Enclosure Serial Number fields on the SteelVine Manager Status Window.

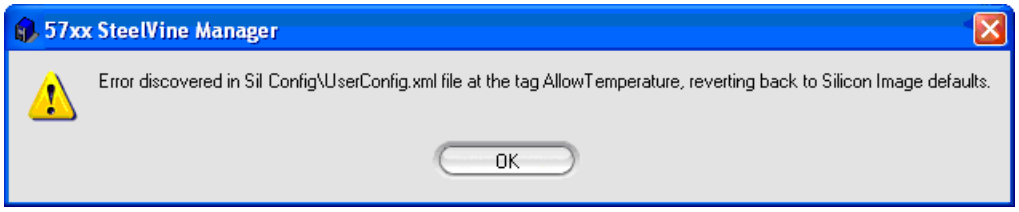
<Drive0Title>Drive #</Drive0Title>

<Drive0Title>Slot #</ Drive0Title>

The "**SysFanSpeedLo**", "**SysFanSpeedHi**", "**PwSupFanSpeedLo**" and "**PwSupFanSpeedHi**" keywords allow you define the high and low threshold values for the system and power supply fans, measured in tachometer clicks per revolution. Any values that are detected outside of these ranges will cause the SteelVine Manager Status Window to indicate those values as warning conditions.

```
<SysFanSpeedLo>100</SysFanSpeedLo>
<SysFanSpeedHi>255</SysFanSpeedHi>
<PwSupFanSpeedLo>100</PwSupFanSpeedLo>
<PwSupFanSpeedHi>255</PwSupFanSpeedHi>
```

If an invalid value is detected in the XML tag value, a pop-up window will appear notifying you of the error and the tag where it can be found.


57xx SteelVine Manager
Error discovered in Sil Config\UserConfig.xml file at the tag AllowTemperature, reverting back to Silicon Image defaults.
OK

***Note:** If the **UserConfig.xml** file is missing, the SteelVine Manager GUI will revert to all Silicon Image default values.*

Creating a Splash Screen

You can further customize the SteelVine Manager by creating your own splash screen.

1. Create the logo for your splash screen – there are no image size limitations
2. Save the logo as '**`userlogo.xpm`**'
   - The .xpm file type is a UNIX-based X PixMap format
3. Put the userlogo.xpm file in the following location:
   `C:\Program Files\Silicon Image\57XX SteelVine\SiI Config`

The splash screen will be displayed for two seconds each time you starts the SteelVine Manager.

14 Monitor and Troubleshooting

This section describes options you can use to monitor and troubleshoot the SteelVine Storage Reference Design.

Monitor the SteelVine Storage Reference Design

Monitor Drive Status

The color of the drives and the labels in the Status Window indicate the state of the drive.

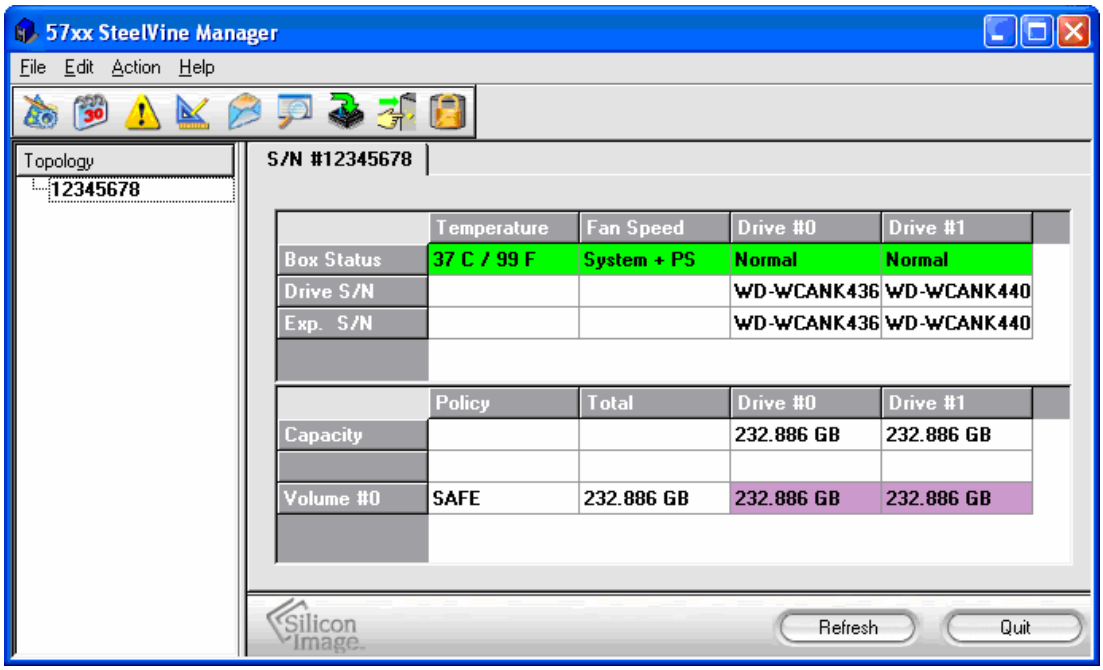


Table 14 - Color Codes and Labels for Drive Status

Color	Label	Definition	Resolution
Green	Normal	Drive is active.	No action is needed.
Gray or Red	Unplugged	Drive is offline. The color is initially gray, and may turn red after writing to a **SAFE** volume.	Secure drive in its bay. Replace drive if needed.
Red	Needs Rebuild	Drive is in a failed state. Data was written to a **SAFE50, SAFE33 or SAFE** volume while the drive was offline.	Replace the failed drive.
	Use Bigger Drive	Drive was replaced with a smaller drive. The appliance is configured with the **SAFE50**, **SAFE33**, **SAFE**, **FAST**, or **BIG** storage policy, and these policies cannot accommodate the smaller drive.	Insert a drive that is the same size as or bigger than the original hard disk drive.
	Mismatch	A drive with an unexpected Serial Number was inserted for a SAFE, FAST or BIG volume.	Insert the correct hard disk drive.
	Not Readable	A bad sector was found on a SAFE volume's source drive while rebuilding.	None; the mirror copy cannot be completed.
	Unavailable	Drive is connected to the second port of the SteelVine Storage Processor, but the host system is not Port Multiplier aware.	None; the drive cannot be accessed from a non-PM aware host.
Orange	Rebuilding or Verifying	Drive is being rebuilt or the rebuild is being verified. The percentage complete also appears.	No action is needed; wait for the rebuild or verify operation to complete.
Light Blue	New drive	New drive was installed.	No action is needed.
Purple	Wrong slot	Mismatched **Serial #** and **Expected Serial #** because a drive is installed in the wrong bay.	Install the correct drive into the bay.

Monitor Temperature

The SteelVine Storage Reference Design uses the following colors to indicate temperature status inside the appliance.

Table 15 - Color Codes for Temperature Status

Color	Definition	Resolution
Green	Temperature is normal	
Yellow	Temperature is greater than 40º Celsius (104º Fahrenheit)	Remove objects that interfere with airflow around the SteelVine Storage Reference Design.
Red	Temperature is greater than 45º Celsius (113º Fahrenheit)	Ensure constant airflow around the SteelVine Storage Reference Design. If there is no airflow, replace the fan. Identify the drive causing the temperature increase and replace it.

Note: *If no temperature sensor is installed, a value of "**n/a**" will appear.*

Monitor Fan Status

The SteelVine Storage Reference Design uses the following colors and values to indicate fan status.

Table 16 - Color Codes for Fan Status

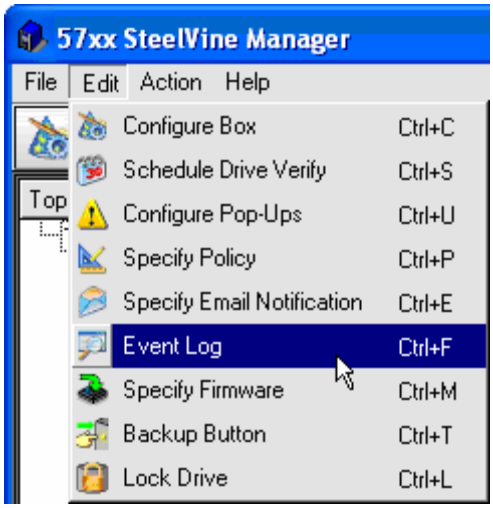
Color	Value	Definition	Resolution
Green	Normal	Both system and power supply fans are functioning within limits.	None required.
Red	System	The system fan is not spinning or is spinning slower than expected.	Contact point of sale for repair.
Red	PS	The power supply fan is not spinning or is spinning slower than expected.	
Red	System + PS	Both system and power supply fans are not spinning or are spinning slower than expected.	

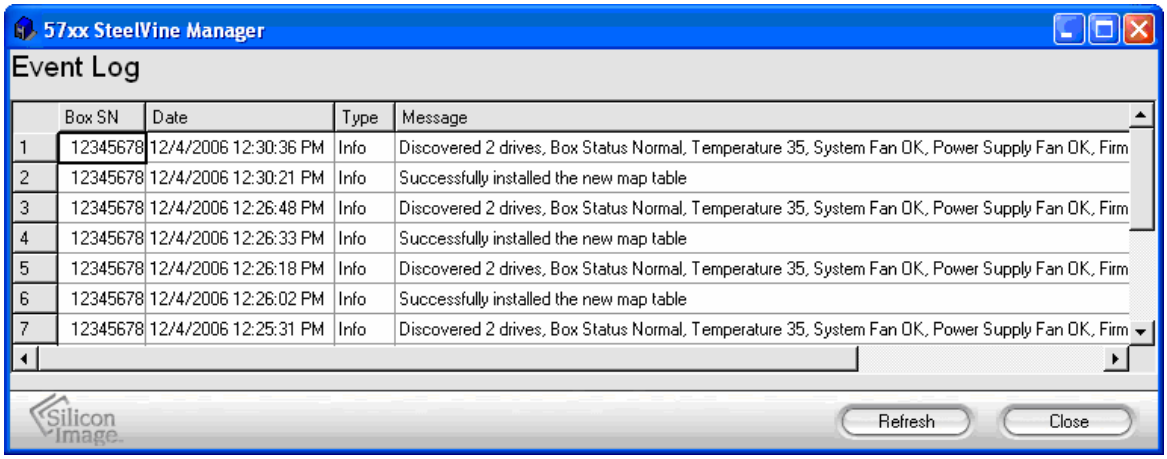
Note: *If no fan speed sensor is installed, a value of "**n/a**" will appear.*

Review Event Logs

Event logs are helpful for troubleshooting and locating a system malfunction.

1. Select **Event Log** from the Edit menu in the Status Window.




57xx SteelVine Manager
Event Log
Box SN
Date
Type
Message
1 12345678 12/4/2006 12:30:36 PM Info Discovered 2 drives, Box Status Normal, Temperature 35, System Fan OK, Power Supply Fan OK, Firm
2 12345678 12/4/2006 12:30:21 PM Info Successfully installed the new map table
3 12345678 12/4/2006 12:26:48 PM Info Discovered 2 drives, Box Status Normal, Temperature 35, System Fan OK, Power Supply Fan OK, Firm
4 12345678 12/4/2006 12:26:33 PM Info Successfully installed the new map table
5 12345678 12/4/2006 12:26:18 PM Info Discovered 2 drives, Box Status Normal, Temperature 35, System Fan OK, Power Supply Fan OK, Firm
6 12345678 12/4/2006 12:26:02 PM Info Successfully installed the new map table
7 12345678 12/4/2006 12:25:31 PM Info Discovered 2 drives, Box Status Normal, Temperature 35, System Fan OK, Power Supply Fan OK, Firm
Silicon Image
Refresh
Close

The Event Log screen displays a list of events in a table format of columns and rows.

- **Date** displays the date and time of the event.
- **Box SN** and **Drive SN** display the respective serial numbers for the event.
- **Drive Manufacturer** displays vendor information.
- **Message** gives an event description.

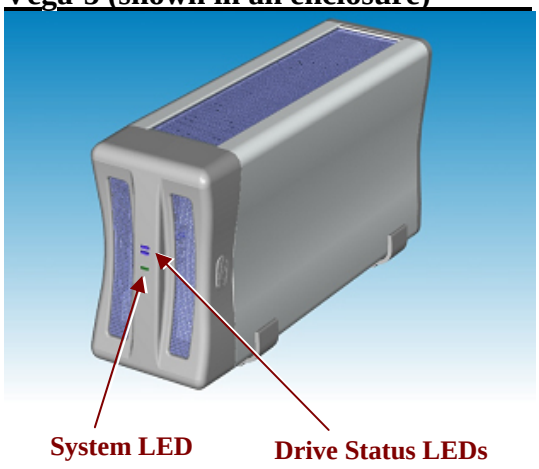
2. Click **Refresh** to update the log or click **Close** to close the log.

Front Panel LEDs

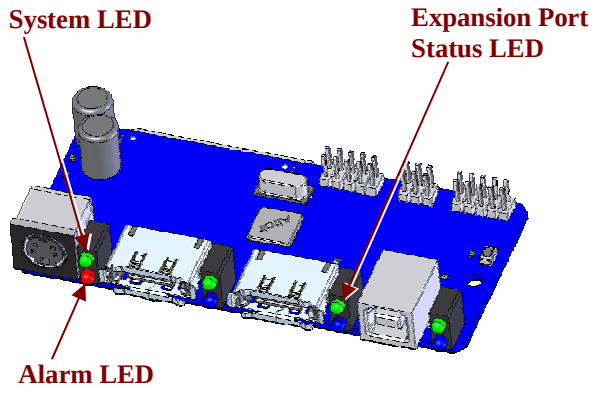
Both disk drives and the system-to-host connection have LEDs that reflect the drive and system states.

Figure 13 - LEDs on the SteelVine Reference Designs

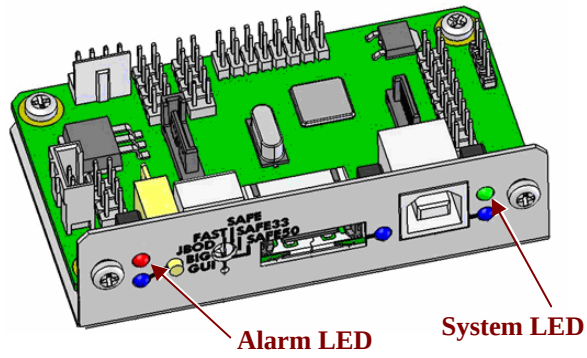
Vega-5 (shown in an enclosure)



Vega-4



Vega-3



Vega-1

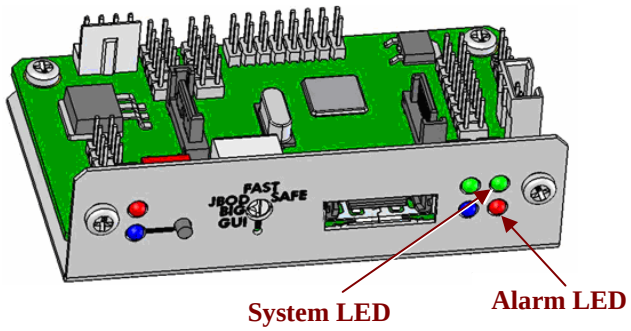


Table 17 - LED States

LED	On (Solid)	Off	Blinking	Flashing
Drive 1	Drive is rebuilding	Drive is not being accessed	Bad drive or disconnected from host	Normal read/write activity
Drive 2	Drive is rebuilding	Drive is not being accessed	Bad drive or disconnected from host	Normal read/write activity
System	Power ON	Power OFF or corrupted firmware	N/A	N/A
Alarm	Error	No error	N/A	N/A

Note: *The easiest way to tell the difference between a blinking LED and a flashing LED is that flashing stops when the read/write activity is finished and blinking does not stop. The blink rate is slower, but the difference in speed is more difficult to detect visually.*

Troubleshooting

Table 18 - Troubleshooting Suggestions

Problem	Resolution
LEDs	
System LED is off.	Confirm power at the outlet, verify power connection, and try an alternate power cable.
	Install new firmware.
Drive 1 or Drive 2 LED is blinking.	Evaluate the drive for failure and replace if needed.
	See *HBA connection* below.
Drive 1 or Drive 2 LED is on continuously.	A **SAFE** volume is rebuilding on the drive.
Fan	
System fan is not running.	Confirm the outlet is powered, verify power connections, and try an alternate power cable.
Power supply fan is not spinning.	
SATA and USB Host connections	
SteelVine Storage Reference Design SATA connection is not recognized by HBA BIOS.	Verify the System LED status to confirm power.
	Verify the SATA connection and try an alternate eSATA cable.
	Verify HBA BIOS recognizes empty SteelVine Storage Reference Design.
	Turn off PCI bus power save mode in the host BIOS.
	Troubleshoot the HBA: • Connect to an alternate SATA port. • Connect an alternate device to the HBA. • Remove all other PCI peripherals to rule out interference. • Move the HBA to an alternate PCI-X slot. • Try the HBA in a PCI slot.
SteelVine Storage Reference Design USB connection is not recognized.	Verify the System LED status to confirm power.
	Verify HBA BIOS recognizes empty SteelVine Storage Reference Design.
	Turn-off PCI bus power save mode in the host BIOS.
	Verify the USB connection and try a different USB cable.
	Connect to a different USB port.
	Refer to Microsoft's Knowledge Base article 310575 (http://support.microsoft.com/?kbid=310575) for additional technical information about problems with USB device connections.

Operating system does not recognize SteelVine virtual volumes.	Verify HBA BIOS recognizes the empty SteelVine Storage Reference Design enclosure.
	Before editing SteelVine virtual volumes in the Configuration Wizard, use the operating system's Disk Manager to delete partitions on the volume.
	Ensure that the SATA HBA driver is current. The SV-HBA3124 and SV-HBA3132 host drivers are available at www.steelvine.com.
	Troubleshoot driver: • Verify driver active status. For Windows, the Device Manager should show the SCSI icon next to the HBA. For Mac OS X, the Disk Utility should show a SCSI Connection ID for the virtual disks on the physical hard drives. Error messages during the driver installation would have indicated issues. • Resolve resource conflicts (IRQ, DMA, or I/O).
	Identify maximum SATA disk drive capacity supported by the operating system and ensure the volume size meets the limits.
	Verify Port Multiplier (PM) support in the HBA.
Review *SteelVine Manager Software Release Notes* available at www.steelvine.com for additional troubleshooting information.	

Appendix A File System Expansion for Windows

Overview

This appendix describes the procedures needed with Microsoft Windows for expanding file systems that have been created on volumes that have increased in size, while preserving all of your existing data. After you have added more hard disk drives to increase the storage capacity of a BIG volume, you must use the supplemental procedure described below to allow the expanded capacity to be recognized by the Windows file system.

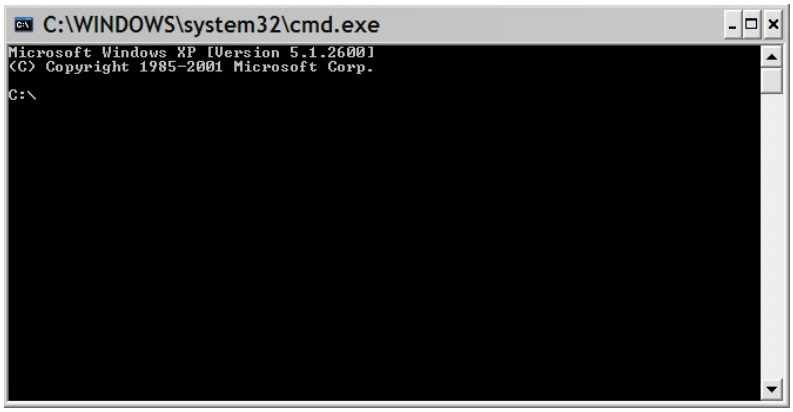
A command-line utility named "Diskpart.exe" ("Disk Partition") enables you to manage hard disk partitions and volumes. This utility is included as part of Windows XP Professional Edition, Windows 2003 Server and Windows Vista. For Windows 2000 or Windows XP Home Edition, you must download the "**diskpart**" utility from Microsoft's website.

Additional third-party products (such as Norton Partition Magic) are available to perform similar volume management activities, but those products are very sophisticated and are not included in this manual.

Procedure

Before you can use DiskPart.exe commands on a hard drive disk partition/volume, you must first list and then select the partition/volume to extend their capacity to match the virtual hard drives created in the SteelVine Manager GUI.

1. Open a command prompt window by clicking **Start → Run**, then entering "**cmd**"



2. At a command prompt, type **`diskpart.`**

```
C:\>diskpart

Microsoft DiskPart version 5.1.3565

Copyright (C) 1999-2003 Microsoft Corporation.
On computer: CYPRESSGC

DISKPART> _
```

3. Type **`list volume`** to display the existing volumes on the computer.

```
DISKPART> list volume

  Volume ###  Ltr  Label        Fs     Type        Size     Status     Info
  ----------  ---  -----------  -----  ----------  -------  ---------  --------
  Volume 0     D                       DVD-ROM         0 B
  Volume 1     C                NTFS   Partition     37 GB  Healthy    System
  Volume 2     E   My BIG Disk  NTFS   Partition    153 GB  Healthy
```

4. Type **`select volume <volume_number>`** where **“`<volume_number>`”** is number of the volume that you want to extend. In this case that will be “2”.

```
DISKPART> select volume 2

Volume 2 is the selected volume.
```

5. Type **`extend`**

```
DISKPART> extend

DiskPart successfully extended the volume.
```

6. Type **`exit`** to quit Diskpart.exe

```
DISKPART> exit

Leaving DiskPart...
```

The volume size will be updated to reflect the expanded physical storage capacity while maintaining all of the existing data that is stored on the volume.

The result of extending the hard disk partition/volume is illustrated below.

Before **extend**:

After **extend**:

Note: *Before the hard drive partition/volume has been extended the "152.67GB Unallocated" was not accessible for data usage. After using the* ***diskpart*** *utility to extend the hard drive partition/volume capacity, the Windows host side matches the virtual hard drive partition/volume created in the SteelVine Manager.*

For more information about the **`diskpart`** utility, please see the documentation on Microsoft's website at: http://www.microsoft.com/resources/documentation/windows/xp/all/proddocs/en-us/diskpart.mspx?mfr=true

Appendix B File System Expansion for Macintosh

Overview

This appendix describes the procedures needed with Apple Mac OS X for expanding file systems that have been created on volumes that have increased in size, while preserving all of your existing data. After you have added more hard disk drives to increase the storage capacity of a BIG volume, you must use the supplemental procedure described below to allow the expanded capacity to be recognized by Mac OS X.

The following example illustrates a hard disk growing from a JBOD to a BIG Storage Policy.

A software tool named **VolumeWorks** from **SubrosaSoft** (available from http://www.subrosasoft.com/OSXSoftware/index.php?main_page=product_info&products_id=6) can be used to grow the partition that was created in JBOD Storage Policy to a BIG Storage Policy disk.

SubrosaSoft VolumeWorks easily organizes your hard drive by creating, resizing, copying your partitions on a Mac OS X (10.3 or higher) system.

There are other third-party products are available to perform similar volume management activities, but those products are very sophisticated and are not described in this manual.

Procedure

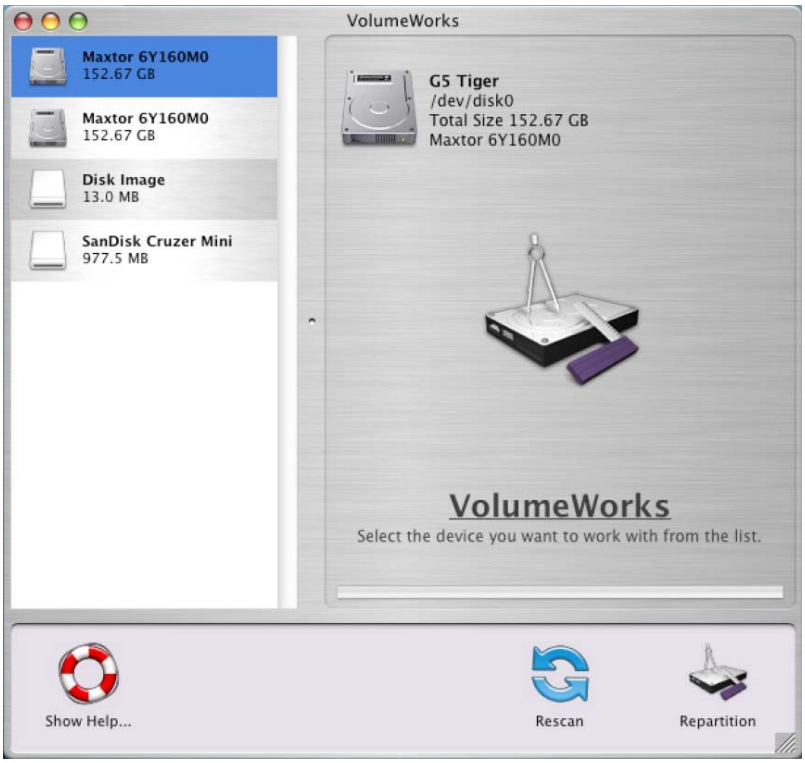
Growing partition/volume with VolumeWorks:

Limitations of Resize/Move

- VolumeWorks can only resize HFS+ partitions
- The second drive when growing from JBOD to BIG must not have any partition information on it. It must be a raw disk with no data of any kind.

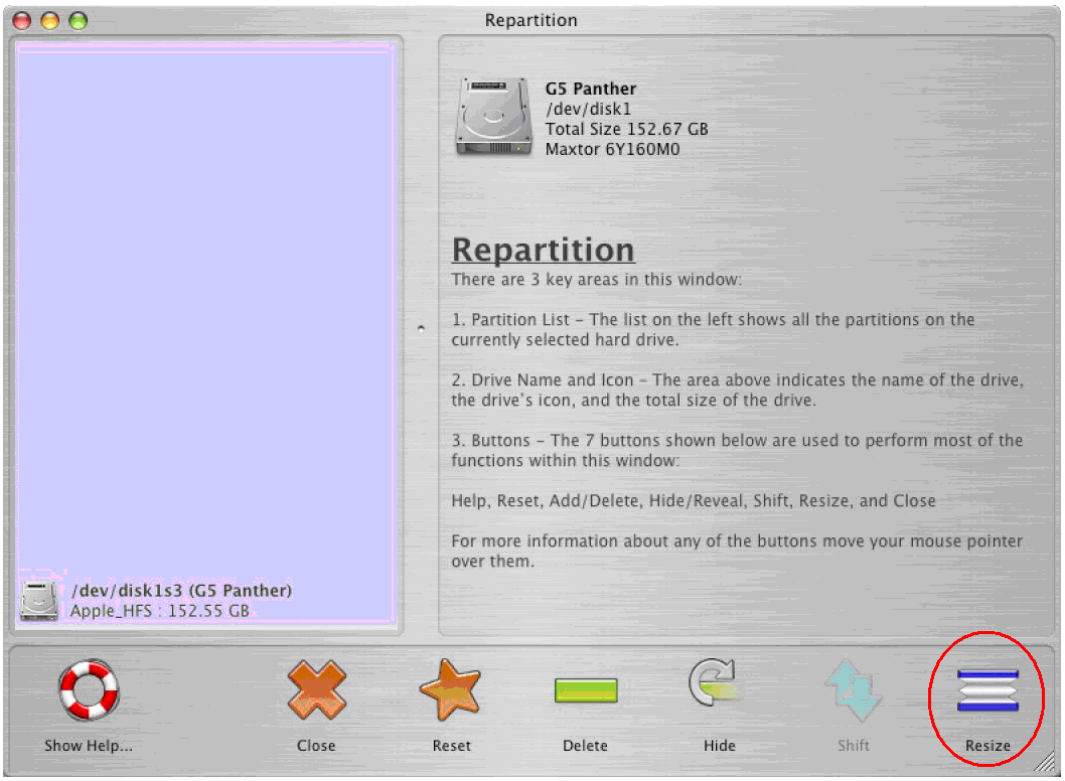
To extend a volume, follow these steps:

1. Start VolumeWorks

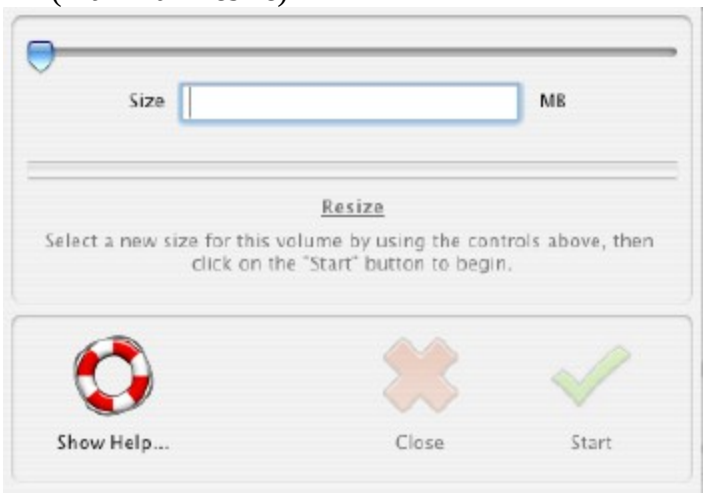


2. Click on the volume that you want to extend, then click on `Repartition` button on the bottom.

3. Now click on the **`Resize`** button on the bottom


Repartition
G5 Panther
/dev/disk1
Total Size 152.67 GB
Maxtor 6Y160M0
Repartition
There are 3 key areas in this window:
1. Partition List – The list on the left shows all the partitions on the currently selected hard drive.
2. Drive Name and Icon – The area above indicates the name of the drive, the drive's icon, and the total size of the drive.
3. Buttons – The 7 buttons shown below are used to perform most of the functions within this window:
Help, Reset, Add/Delete, Hide/Reveal, Shift, Resize, and Close
For more information about any of the buttons move your mouse pointer over them.
/dev/disk1s3 (G5 Panther)
Apple_HFS : 152.55 GB
Show Help...
Close
Reset
Delete
Hide
Shift
Resize

4. Now move the slider all the way to the right within the Resize dialog box. (Maximum resize)



Once you click on **`Start`**, it will execute the volume resize request.

The new storage capacity will be added to the existing drive while maintaining the data on the volume.

Appendix C File System Expansion for Linux

Overview

This appendix describes the procedures needed with Linux for expanding file systems that have been created on volumes that have increased in size, while preserving all of your existing data. After you have added more hard disk drives to increase the storage capacity of a BIG volume, you must use the supplemental procedure described below to allow the expanded capacity to be recognized by Linux.

The following example illustrates a hard disk growing from a JBOD to a BIG Storage Policy.

A software tool named **GNU Parted** (available from http://www.gnu.org/software/parted/parted.html) can be used to grow the partition that was created in JBOD Storage Policy to a BIG Storage Policy disk.

GNU Parted easily organizes your hard drive by creating, resizing, copying your partitions on a Linux system.

There are other third-party products are available to perform similar volume management activities, but those products are very sophisticated and are not included in this manual.

Procedure

Growing partition/volume with GNU Parted:

To extend a volume, follow these steps:

1. Start parted by typing **`parted /dev/hdc`**. (where **`/dev/hdc`** is the device path of the hard disk for the system) This will bring up the parted console indicated by the **`parted`** prompt.

   ```
   # parted /dev/hdc
   (parted)
   ```

2. Type **print** within the parted console to bring up the volume and disk information.

```
(parted) print
Disk geometry for /dev/hdc: 0.000-800000.000 megabytes
Disk label type: msdos
Minor    Start       End     Type      Filesystem  Flags
1       0.063    400000.000  primary   ext2
```

3. Use the **resize** command extend the size of volume 1 listed above.

```
(parted) resize 1 0.063 400000
```

4. Type print to verify the resize of volume 1.

```
(parted) print
Disk geometry for /dev/hdc: 0.000-800000.000 megabytes
Disk label type: msdos
Minor    Start       End     Type      Filesystem  Flags
1       0.063    800000.000  primary   ext2
```

The new space should be added to the existing drive while **maintaining the data** on the volume.

Before **resize**:

```
(parted) print
Disk geometry for /dev/hdc: 0.000-800000.000 megabytes
Disk label type: msdos
Minor    Start       End     Type      Filesystem  Flags
1       0.063    400000.000  primary   ext2
```

After **resize**:

```
(parted) print
Disk geometry for /dev/hdc: 0.000-800000.000 megabytes
Disk label type: msdos
Minor    Start       End     Type      Filesystem  Flags
1       0.063    800000.000  primary   ext2
```